A SURVEY OF FOUNDATIONS INVOLVED IN U.S. HEALTH R&D

U.S. DEPARTMENT OF HEALTH,
EDUCATION AND WELFARE
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OF HEALTH

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FINAL REPORT

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EXECUTIVE SUMMARY

• PURPOSE OF THIS RESEARCH PROJECT

This project, conducted by COOPER AND COMPANY for the National Institutes of Health, was fundamentally concerned with improving NIH's current methodology for estimating private non-profit foundation support for health R & D activities. Annual NIH estimates of support have been based on a review of publically available information on grants made by a sample of 24 foundations. NIH estimates the total grant dollars expended by all foundations for the purposes of health R & D in a given year by utilizing a historically derived factor which relates the support of health R & D by the twenty-four foundations to the support of all private non-profit foundations.

The current research, utilizing a mail survey of foundations, was aimed at establishing a benchmark estimate of support for health R & D against which the NIH estimate can be compared, investigating the decision-making process vis-a-vis foundation funding of grant requests and proposals, and redesigning NIH's estimation methodology and/or revising the historically derived adjustment factor, if deemed necessary.

• REVIEW OF PUBLICLY AVAILABLE INFORMATION ON FOUNDATIONS

The first stage of this research effort involved a thorough review of publicly available information on foundation grants for the year 1974. The purpose of this review was twofold: (1) to initially estimate the level of foundation support for health R & D for that year, and (2) to characterize support for health R & D by various population parameters,

in order to develop a sampling and stratification plan for the mail survey of foundations. The universe of foundations was divided into seven strata based upon total foundation grant dollars in 1974 and the likelihood that the foundation made health R & D grants in 1974 as determined by computer searches of Foundation Center data banks.

We reviewed the grants made in 1974 by approximately 715 foundations. On the basis of this review we estimate that:

- 6% of all foundations definitely had health R & D grants in 1974,
- 58% did not have such grants, and
- for 36% of the foundations in the universe it could not be determined solely on the basis of publicly available information whether or not they had health R & D grants in 1974.

Predicated upon our analysis of available grant data, we estimated that private non-profit foundations gave minimally $55 million in grants in 1974 for the purposes of health R & D activities, and possibly as high as $166 million.

- METHODOLOGY OF MAIL SURVEY OF FOUNDATIONS

The second stage of this project involved a mail survey of 200 private non-profit foundations. This survey was designed not only to provide more accurate data on foundation support for health R & D, but also to obtain information on such areas as the grant evaluation process, how

final decisions on grants are arrived at, major foundation fields of interest, stability of support for health R & D, foundation budget allocation procedures, and the effects of recent revisions in the tax laws concerning foundations. The sample was stratified on the basis of: (1) total foundation grant dollars in 1974, (2) whether or not the foundation was identified as probably supporting health R & D based upon computer searches of Foundation Center data banks, and (3) whether or not it could be determined on the basis of the review of publicly available grant data whether the foundation supported health R & D activities in 1974.

Foundations which made no health R & D grants in 1974 were *not* included among the foundations sampled. All foundations which had over $4 million in grants in 1974 and which could not be ruled out as making no health R & D grants in 1974 were included. Foundations which made grants of less than $4 million were included with varying sampling ratios depending on initial estimates of their grants to health R & D.

Seventy percent of the foundations sampled completed and returned the survey. We were able to contact by telephone 60% of the foundations which did not mail in completed surveys and obtain information on key areas covered by the survey, including foundation health R & D grant dollars in 1972, 1974 and 1976. We therefore achieved, overall, almost a ninety percent response rate. In addition, "best estimates" were developed for each of the remaining non-respondents based on both publicly available data and the responses of similar foundations to this survey.

- FOUNDATION SUPPORT FOR HEALTH R & D

The Division of Resources Analysis of NIH had previously estimated that in 1974 foundations gave only $53.8 million in grants for health R & D. On the basis of the mail survey we estimate the following:

- Total foundation support for health R & D activities in the year 1974 amounted to $78.9 million.
- Thirty foundations which had over $4 million in total grants in 1974 account for almost 40% of this $78.9 million figure.
- An additional 164 foundations, foundations which had between $0.5 and $4.0 million in total grants in 1974, account for over 22% of total foundation support for health R & D activities in 1974. Thus, 194 of the estimated 27,000 private non-profit foundations in the United States (0.7%) account for over 68% of the total foundation health R & D grant dollars.
- Overall, 6.7% of the foundations in the United States support health R & D activities to some extent.

- HEALTH R & D GRANT RECIPIENTS

Grant recipients were characterized by the focus of their research and by type of institution. With respect to focus:

- About two-thirds (63%) of foundation health R & D grant dollars were for biomedical R & D (e.g. research on diseases, injuries, cellular biology, genetics, artificial assistance devices, etc.),
- 20% of the grants were for health services delivery R & D (e.g. research on the organization, financing, and delivery of health care), and
- 17% of the grants went to all other health R & D.

With respect to institution:

- Over one half (53.7%) of health R & D grant dollars in 1974 were given to either academic institutions or medical schools,
- 38.4% to other domestic private non-profit organizations,
- 6.5% to foreign recipients, and
- 1.4% to all other recipients (units of Federal, State, or local government, industrial firms, or for health R & D performed by the foundations themselves).

Although one might expect that the bulk of foundation support for health R & D comes from foundations whose major interest is in health, this is not the case.

- Nearly 40% of total health R & D grant dollars is accounted for by foundations whose major interest is in education,

- 13.6% is accounted for by foundations whose major interest is welfare, and
- Only 24.7% is accounted for by foundations whose major interest is in health *per se* or in health R & D.

- STABILITY OF SUPPORT FOR HEALTH R & D

With respect to foundations which funded health R & D activities in 1974, we estimate that:

- Nearly half of the foundations funded health R & D activities to the same degree in 1976 as they did in 1974,
- 32% funded health R & D to a greater degree in 1976 than in 1974, and
- 19% funded health R & D to a lesser degree in 1976 than in 1974.
- Over 31% of the foundations which supported health R & D in 1974 maintained the same general level of support over the five-year period of 1972-1976.

A slightly different pattern emerges if we classify foundations by their degree of stability and then consider the level of their giving to health R & D:

- Only 36% of total foundation health R & D grant dollars are estimated to be accounted for by foundations which are stable in their support of health R & D,

- 31% of health R & D grant dollars are accounted for by foundations which have a current trend towards increased

support and,

- Fully 33% of health R & D grant dollars are accounted for by foundations with a trend towards decreased support.

In general, larger foundations are less stable in their support of health R & D than smaller foundations.

- RECOMMENDATIONS FOR REVISIONS IN NIH'S ESTIMATION METHODOLOGY

NIH currently bases its estimate of health R & D on a sample of 24 foundations, called the DRA "pool". The COOPER AND COMPANY estimate of total foundation giving to health R & D grant dollars in 1974 is significantly higher than the corresponding NIH figure. This difference is primarily due to an underestimate of the health R & D grant dollars of smaller foundations by NIH, as reflected in a relatively low "historical multiplier."

In order to raise NIH estimates for future years to the COOPER AND COMPANY level, we recommend that NIH construct a new multiplier. This can be achieved by comparing the COOPER AND COMPANY estimate of $78.9 million in health R & D grant dollars in 1974 for the entire universe of foundations to the DRA estimate of $28.6 million in health R & D grant dollars in 1974 for the 24 foundations in the "pool." Based upon the mail survey results, the new multiplier should be 2.76.

In our judgment it is not necessary for NIH to conduct an annual mail survey of foundations in order to fairly accurately estimate foundation support for health R & D.

1 INTRODUCTION

This report is designed to serve as a descriptive summary of the recently completed study of private non-profit foundation support for health research and development sponsored by the National Institutes of Health. It includes a review of NIH objectives for the study; the research strategy devised to meet those objectives; the development and execution of a survey of foundations to ascertain the level and nature of support for health R & D, shifts in this support, and foundation characteristics associated with support of health R & D; and the analysis of the results of this survey.

1.1 PURPOSE OF THIS STUDY

The National Institutes of Health contracted with COOPER AND COMPANY to conduct a survey designed to assess the accuracy and reliability of NIH's methodology for estimating foundation support for health R & D. NIH has, for a number of years, collected and analyzed data on the support for health research and development projects by various sectors of the economy. Private non-profit foundations in the United States comprise one such sector. Efforts in this area have focused primarily on accurately predicting annual support and projecting future support for health R & D.

Currently, the annual support estimates are based on the actual dollar amount of health research and development expenditures of a sample or "pool" of twenty-four foundations. This figure, derived from the pool, is adjusted by an historically derived factor to create an

estimate for the universe of all private non-profit foundations. Until now NIH has avoided the use of an annual survey by deriving estimates of health R & D based upon publically available data.

However, these data sources, which consist primarily of foundation annual reports and IRS 990 forms which the foundations are required to file annually, have severe limitations in terms of both the amount and quality of descriptive information contained in them. Additionally there have been recent shifts in interest in the field of health R & D by many of the foundations in the NIH pool.

The primary objective of this study was to accurately estimate the total level of foundation support for health R & D for the year 1974, using information obtained from a special mail survey of foundations. This estimate was compared to the previous NIH estimate for the same year in order to assess the degree of accuracy of NIH estimating methodology and to provide a benchmark by which an appropriate multiplier could be developed for use in future years. The survey was also designed to collect information about the distribution of health R & D dollars by focus of the grant and type of grant recipient, assess the stability of support for health R & D and the degree of foundation commitment to this field of interest, and examine the nature of the grant decision-making process and other factors potentially influencing support for health R & D.

1.2 ORGANIZATION OF THIS REPORT

This report opens in Section 2 with the delineation of the scope

of this study including the definition of key concepts (i.e. health R & D, foundation) and a description of the universe of foundations and foundation grant recipients. Section 3 reviews the available grant data and presents an estimate of foundation support for health R & D and an analysis of health R & D grant dollars by focus and type of recipient based upon the available grant data. Section 4 details the design and execution of a mail survey of 200 foundations. It is followed in Section 5 by a description of the methodology used to estimate foundation support for health R & D in 1974 and analyzes such support by grant focus and type of recipient. Section 6 describes factors affecting foundation support for health R & D. Section 7 investigates the stability of support for health R & D and factors affecting funding stability. Finally Section 8 reviews N.I.H. methodology for estimating foundation support, assesses the need for periodic surveys to accurately estimate this support, and presents recommendations for further research.

2 DELINEATION OF SCOPE OF STUDY: DEFINITION OF KEY CONCEPTS AND DESCRIPTION OF UNIVERSE OF FOUNDATIONS AND FOUNDATION GRANT RECIPIENTS

In order to collect information concerning the level and nature of support for health research and development by private non-profit foundations, concrete operational definitions of both "health research and development" and "private non-profit foundations" must be specified, and if need be, developed and refined. We begin this section, therefore, with the definition of these key concepts. It is followed by a short description of the universe of foundations with which this study is concerned and the development of a typology of foundation grant recipients.

2.1 HEALTH RESEARCH AND DEVELOPMENT DEFINED

2.1.1 NIH DEFINITION

The field of health research and development has been defined by the National Institutes of Health* as activities related to three major research areas:

A. Biomedical Research, which encompasses:

(1) Research on diseases, syndrome, injuries or conditions, whether mental or physical, affecting human beings, and which focuses on their cause, occurrence, prevention, detection, treatment, cure or rehabilitation;

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*U. S. Department of Health, Education and Welfare, Public Health Service, National Institutes of Health, U.S. Private Foundation Support of Health Research and Development: Resources for Health R & D Report No. 22, Division of Resource Analysis, November, 1975.

(2) Broad types of scientific research which are not directed towards a specific disease, but are undertaken to obtain an understanding of underlying life processes which affect diseases and human well-being. These include such areas as cellular and molecular biology, genetics, etc.;

(3) Research on artificial assistance devices such as renal dialysis machines, artificial organs, prosthetics and other surgical techniques or procedures as they impact on human health;

(4) The biomedical aspects of R & D which are directed towards the maintenance of human effectiveness in normal and stressful environments such as research on sickness and the characteristics of human health in war or other stressful situations.

B. Health Services Delivery Research, which includes research on the organization, delivery and financing of health care and research on the development of health manpower.

C. "Other" Research, which embraces a broad range of related and interrelated research activities, including:

(1) Research on problems of human physical and mental health and well-being that are not specifically identifiable in terms of disease. Examples of such research include that on juvenile delinquency and sexual deviance and other psycho-social behavioral problems;

(2) The research on physical and man-made environments as they impact on man's physical and mental well-being and quality of life, including research on the health effects of air and water pollution, occupational safety and health;

(3) Research on nutritional and population problems (including contraception and sterilization techniques) which impair, contribute to, or otherwise affect optimum health.

The NIH definition goes on to exclude from the field of health R & D various operational activities, such as actual delivery of service and care of patients, medical education, etc. Construction of facilities for either service or research activities is similarly excluded, as is the general category of training grants and fellowships, unless the

training is conducted in pursuance of a specific and identifiable research project. Demonstration projects are included within the scope of health research and development only to the extent to which evaluation and innovation are both present.

The NIH definition of health research and development was used by COOPER AND COMPANY in the preliminary analysis of grants of a small number of foundations whose grant activities the Division of Resource Analysis (DRA) of the National Institutes of Health has been following for a number of years.* The purpose of this preliminary analysis was to determine the extent of foundations' support of health research and development (i.e. the foundation grant dollars restricted to health R & D), the focus of the support (i.e. whether the grants were for biomedical R & D, health services delivery R & D, or "other R & D), and the type(s) of grant recipients (e.g. academic institutions, Medical schools, private non-profit institutions, federal and local government, etc.).** The results of this preliminary analysis were compared to previous DRA estimates. Major discrepancies were found between the two sets of estimates; discrepancies which in the main centered around two "gray areas" of the NIH definition: environmental research and socio-psychological research. These problem areas will be discussed in turn.

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*DRA currently follows the grant activities of 37 foundations; it bases its estimates of health R & D grant dollars on the grant activities of a subset of these foundations (called the DRA pool). See Section 3.3.

**See Section 3 for a full description of this preliminary analysis.

2.1.2 PROBLEMS IN APPLYING THE NIH DEFINITION IN THE ANALYSIS OF FOUNDATION GRANTS

2.1.2.1 ENVIRONMENTAL RESEARCH

At one conceptual level it is possible to include in the area of "health" many fields of study, because these fields may be ultimately related to human health. For example, agricultural studies, reforestation, water resources, etc., may ultimately affect human health. However, if one were to include research areas of this type within the scope of "health", an extremely broad definition of health R & D would result. Such a broad definition, including many research areas marginal to the field of health, was deemed undesirable for grant analysis purposes by both DRA and COOPER AND COMPANY.

In order to narrow the definition the following rules were adopted:

(1) Research in such areas as food production, agronomy, rural development, rural modernization, water resources, reforestation, etc., is not to be considered health R & D unless the grant description (contained in the foundation's annual report or I.R.S. 990 forms)* makes specific reference to the relevance of the research to the field of human health. For example, a "food production" project with an emphasis on nutritional value is to be classified as health R & D, but

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*See Section 3.1.

it emphasized increased productivity, it would not be so classified.

(2) Research in the broad areas of environment, conservation, and ecology (including research on air pollution) is to be considered health R & D if it is fundamentally concerned with assessing or evaluating the effects on health of pollution or other environmental problems; if the focus of the research is on the solution of these problems, the research is not considered to lie within the domain of health R & D.

(3) All family planning, population control, and demographic research is to be classified as health R & D, even if the emphasis is on the assessment, rather than the solution of, population problems.

2.1.2.2 SOCIAL PSYCHOLOGICAL RESEARCH

The area of research which generated the greatest divergence of opinion was the treatment of what could generally be called social-psychological R & D. It was generally agreed that many of the subfields within the broad areas of psychology and sociology can be considered health-related, but that others are clearly not. For example, the study of linguistics, learning processes and memory are more educationally oriented than health-related. Interactional and developmental research, however, is not easily categorized; seemingly identical research, performed under the auspices of different types of institutions (e.g. academic institution, medical school, psychoanalytic institute, etc.) may be described by the grantee or grantor as being

health-related or non-health related. Additionally, this classification may differ by the age and other salient characteristics of the subjects of the research (e.g. nursery school children versus prison inmates), despite the fact that the subject matter may be seemingly the same (e.g. interactional patterns in confined spaces).

It was decided by DRA and COOPER AND COMPANY to narrowly define health R & D vis-à-vis social-psychological research: all social-psychological studies done under the auspices of a medical school or hospital are to be considered health R & D, unless they are in the areas of linguistics, memory and learning processes. Similar studies not done under such auspices were to be considered health R & D only when specifically based in psysiology, biomedicine or pathology. In essence, this decision results in a distinction between studies directly germane to mental health and studies more generally based in developmental issues.

2.2 DEFINITION OF FOUNDATION

In common usage the term "foundation" has been used to describe a variety of organizations including voluntary health organizations (e.g. the Kidney Foundation), community welfare agencies, and even units of government (e.g. The National Science Foundation). The Foundation Center, a non-profit corporation supported by the foundations themselves whose major purpose is the collection and dissemination of factual information concerning philanthropic foundations in the United States, defines* a foundation as:

*The Foundation Center, The Foundation Directory, Edition 5, New York: Columbia University Press, 1975, p. xi.

> A non-governmental, nonprofit organization, with funds and program managed by its own trustees or directors, and established to maintain or aid social, educational, charitable, religious, or other activities serving the common welfare, primarily through the making of grants. Both charitable trusts and corporations are included. Excluded are organizations which bear the name "foundation" but whose primary purposes are other than awarding of grants; for example, making general appeals to the public for funds; acting as trade associations for industrial or other special groups; or which are restricted by charter solely to aiding one or several named institutions; or which function as endowments set up for special purposes within colleges, churches, or other organizations and are governed by the trustees of the parent institution.

For purposes of the present study we have operationally defined a "foundation" as an organization which has been classified as a private non-profit foundation for tax purposes by the Internal Revenue Service (see Sections 503(c)(3), 509(a) and 170(b)(1)(A) of the Tax Code.) We are constrained to adopt this definition since the only publicly available information on foundations is on foundations which are so classified. In 1974 the I.R.S. classified over 27,700 organizations as private, non-profit foundations.* The Foundation Center has information on over 27,000 of these foundations.

2.3 GENERAL DESCRIPTION OF UNIVERSE OF FOUNDATIONS

The American Association of Fund Raising Counsels** estimated that in 1974 private non-profit foundations contributed 2.11 billion to charitable causes in the United States. Although in 1974 there were

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*These foundations must file an annual I.R.S. report (990 AR or 990 PF) on their activities.

**American Association of Fund Raising Counsels, Giving USA, New York; 1975, p. 6.

more than 27,000 foundations in the United States, a small number of these foundations account for a lion's share of the $2.11 billion in grants. Specifically, the 49 largest foundations in terms of size of their assets (foundations with assets of $25 million or more) account for approximately 34% of the $2.11 billion total; the 805 largest foundations (with assets of $5 million or more) account for 58% of this total; and the 2,504 largest foundations (with assets of $1 million or more)* account for nearly 70% of this total.** Over 90% of the non-profit foundations are small — with assets under $1 million — and in toto account for only 30% of the estimated 1974 grant dollars.

There are four main types of foundations. Private operating foundations (which comprise approximately 50% of the private non-profit foundation universe) spend the majority of their income in the active conduct of charitable undertakings or research themselves, rather than distributing their income to other organizations. Company sponsored foundations are foundations which are closely tied to the company which created them. Community foundations are supported by and operated for the communities and local areas they serve. There are over 200 community foundations in the United States. The rest of the universe consists of other private non-profit foundations ranging in size from small family foundations which are set up by living persons (rather than by bequest) to serve as channels for the family's charitable interests to

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*The NIH estimates that, non-surprisingly, there is a very high positive correlation — 0.95 — between asset value of a foundation and its annual grant dollars (U.S. Private Foundation Support of Health Research and Development, pp. 5-6).

**The Foundation Center, The Foundation Directory, pp. xxi-xxii.

foundations with assets of $100 million or more with many paid staff members (e.g., the Ford Foundation, Rockefeller Foundation, etc.).*

The average foundation grant is relatively small; even among the approximately 2,500 larger foundations which are included in the Foundation Directory the average grant is only $9,410.** Among the smaller foundations not included in the Directory the average grant size can be expected to be considerably smaller.

The Foundation Center analyzed the field of interest for the grants of $5,000 or more of the approximately 270 mostly large national foundations included in The Foundation Grants Index*** covering the year 1974. They found that 24% of the reported grants were in the field of education, 16% in health, 24% in welfare, 16% in science and technology, 11% in humanities, 7% for international activities and 3% in the field of religion.

2.4 DESCRIPTION OF TYPES OF FOUNDATION GRANT RECIPIENTS

The National Institutes of Health divides foundation grant recipients into three major categories: intramural, extramural, and foreign. Intramural research and development refers to R & D activities carried out by the "in-house" staff of the grant-making foundation itself. Intramural R & D does not include the activities of consultants

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*The Foundation Center, Facts on Foundations, mimeograph, New York, 1976.

**The Foundation Center, The Foundation Directory, p. xx.

***The Foundation Center, The Foundation Grants Index, New York: Columbia University Press, 1975.

or other personnel who are not part of regular foundation staff or foundation staff activities concerned with the monitoring or administration of grants for research activities to be performed by other organizations. A foundation which conducts intramural research or other charitable undertakings may also, of course, give grants to extramural or foreign recipients.

Extramural grant recipients are organizations or individuals outside of the grant-making foundation who receive foundation grants and are located or reside in the United States. Extramural grant recipients may be further subdivided into:

- Units of State or local Government — including all State and local agencies with the exception of institutions of higher learning.

- Units of Federal Government

- Academic Institutions — which provide resident instruction for at least two years above the secondary level. Universities, four year colleges, independent professional schools (including medical schools), and research institutes owned by the academic institution are all classified as "academic institutions."

- Private non-profit organizations — such as voluntary organizations, charitable institutions, research institutes, and (other) foundations. Individuals who are grant recipients but are not associated with any organization in connection with the receipt of the grant(s) are also classified under

this rubric. Institutions of higher learning, even though they may be "non-profit organizations" are classified as "academic institutions."

- Profit making organizations — which are primarily but not exclusively industrial firms.

Finally, foreign recipients are organizations or individuals located outside of the United States who are foundation grant recipients (e.g. foreign organizations; units of foreign governments; international organizations such as NATO and WHO; U.S. agencies, organizations and citizens performing research activities or conducting charitable undertakings abroad, etc.).

For purposes of the present study we have adopted the NIH typology of grant recipients.

3 REVIEW OF AVAILABLE GRANT DATA

Before embarking on the survey of private non-profit foundation support for health R & D, the available data pertaining to foundation grants for the year 1974 was reviewed. The purpose of this review was to:

- Determine the type of data which is readily available on foundation grants (so that this data need not be repeated in the survey).
- Collect data about foundation grants in general and support for health R & D that would aid in the design of the survey (e.g. specific questions to be asked, stratification scheme, specific sampling procedures, etc.).

In the following sections the methodology utilized in the review of the available grant data will be described, the results of this review presented, and the need for further survey research will be discussed. We begin with a description of the available sources of data in regard to foundation grants.

3.1 METHODOLOGY FOR REVIEW OF GRANTS

3.1.1 AVAILABLE SOURCES OF DATA

As previously noted, The Foundation Center is a non-profit corporation supported by the foundations themselves. One of its major functions is the collection and dissemination of factual information

concerning grant-making foundations in the United States.* Its library and computer files form the largest, most comprehensive single source of information which is publically available.

There are three primary computer files** available for use:

- The Directory Data Bank contains basic information on approximately 2,500 of the largest foundations, including a brief description of the general purpose or interests of each foundation. It contains no information about individual grants.

- The Grants Index Data Bank contains brief descriptions of most grants for over $5,000 made by approximately 420 foundations. Most of these are large foundations, in terms of the value of their assets.

- The National Data Bank contains information abstracted from IRS 990-AR and 990-PF forms. It contains no information about individual grants; however it is the most complete list of all foundations in the universe.

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*The Foundation Center has libraries in New York, Washington, D.C., and a national collection in Chicago containing extensive collections of books, documents and reports on activities and program interests of more than 27,000 foundations throughout the United States. Additionally, the Foundation Center has regional reference collections throughout the country containing information on foundations within the immediate State or region.

**For a detailed description of these computer files, see Appendix A.

In addition to the information available in computer files, The Foundation Center national libraries also have available the annual reports of many of the larger foundations and IRS 990 forms on microfiche on more than 27,000 foundations. The Foundation Center also publishes the following reference works about foundations:

- The Foundation Center Directory - containing information on 2,500 foundations, most of which are large (value of assets $1 million or more) and national in scope, corresponding to the Directory Data Bank.

- The Foundation Center Grants Index - giving detailed information on grants of $5,000 or more made by 420 foundations corresponding to the Grants Index Data Bank.

- The Foundation Center Source Book - containing detailed data on grant activities of 230 foundations.

The latest editions of The Foundation Directory, Grants Index and Source Book, published in 1975, cover the year 1974. The Directory Data Bank, Grants Index Data Bank, and National Bank are updated semi-annually or annually.

3.1.2 STRATIFYING THE UNIVERSE OF FOUNDATIONS

Stratifying a universe to be sampled is appropriate under two sets of circumstances: (a) when subpopulations in which the investigator is interested would be under-represented in a random sampling of the population and (b) when the variance vis-à-vis particular dependent variables is expected to be high and would be reduced — or minimally

reduced in certain subpopulations or clusterings of population characteristics in which the investigator is interested — were stratification to be employed. The second set of circumstances clearly holds in the present investigation. Less than 9% of the total number of foundations accounts for nearly 70% of the grant dollars. Oversampling this 9% of foundations — a procedure made possible by stratification — would give a clearer picture of these foundations and of the universe as a whole (i.e. by reduction in sample variance).

Since the major focus of the present study is to accurately estimate the foundations' support in 1974 of health R & D, a stratification scheme was developed to reduce the variance of this estimate. Total grant dollars of each foundation in 1974 was chosen as the basis for stratifying the universe of foundations. It was chosen because: first, it is known for almost all foundations; and second, total grant dollars represents the maximum level of health R & D support, and thus is highly related to it. Therefore, stratifying by total grant dollars ensures reduction of the variance of health R & D dollars by setting a maximum range for this parameter for each stratum.

Because there are no logical and necessary points at which to divide the universe, the universe was arbitrarily partitioned into four strata, based upon the following important considerations:

- Since a complete analysis of all grants made by the top stratum of foundations was planned, it was desirable to keep the size of the stratum relatively small due to the cost and time involved in detailed analysis of a larger number of

foundations.

- Each stratum would represent roughly 25% of the total foundation grant dollars in the year 1974.
- The strata should be defined in such a way that existing lists of foundations (e.g. Directory Data Bank, National Data Bank, etc.) may be easily utilized for sampling purposes.

The composition of these four strata is presented below:

- Stratum I Foundations whose total grants in 1974 were $4 million or more.
- Stratum II Foundations whose total grants in 1974 were more than $500,000 but less than $4 million.
- Stratum III Foundations whose total grants in 1974 were more than $75,000 but less than $500,000.
- Stratum IV Foundations whose total grants in 1974 were less than $75,000.

3.1.2.1 FURTHER REFINEMENTS IN THE STRATIFICATION SCHEME

The various computer files of the Foundation Center contain considerable descriptive information on each foundation including general purpose of the foundation and fields of interest of the foundation. We decided to utilize this information in order to further subdivide the strata into (1) a subpopulation of foundations which probably

support health R & D; (2) a subpopulation of foundations which probably do not support health R & D. It was expected that this further subdivision of the strata would reduce the variance of the estimates of the mean health R & D dollars for each stratum and for the universe as a whole which would be developed from a detailed analysis of the grants lists of the foundations to be sampled.

Three sets of procedures for identifying those foundations which probably support health R & D and those which do not were developed. The first procedure involved a computer search of the National Data Bank, singling out those foundations which:

- Contained the words "medic" or "health" in the name of the foundation, and/or
- Stated in their IRS 990-AR or 990-PF form that the purposes, activities, or operations of the foundation are concerned with or that the type of foundation is:* "scientific research (diseases)", "other medical research", "community health planning" or "mental health care."

The second procedure involved a computer search of the Grants Index Data Bank, singling out those foundations who made one or more grants that were described as being health research related. This was accomplished by compiling a "key-word" list of health-related words

*Each foundation is requested to select up to three "activity code numbers" which "best describe or more accurately identify (the) purposes, activities, operations or type of organization."

(e.g. demograph..., dental..., microbiol..., etc.) and another "key-word" list of words that are research-related (e.g., evaluat..., experiment..., examin..., etc.). Grants described both in terms of health-related words and research words were identified and the foundations which made such grants were specified.

The third procedure involved a computer search of the Directory Data Bank, singling out those foundations (as was done in the case of the Grants Index Data Bank search) whose activities were described as being concerned with both "health" and "research." As was done previously, key word lists were constructed for both "health" and "research."

Since we would be sampling every foundation in Stratum I, only Strata II to IV were further subdivided by the computer search techniques. As a result of the computer searches* a total of 1,683 foundations were identified as probably supporting health R & D (and having made health R & D grants in 1974): 193 in Stratum II, 293 in Stratum III, and 1197 in Stratum IV. Thus, the final stratification scheme developed consisted of seven stratification cells — the four original strata based on foundation total grant dollars, with Strata II to IV further stratified into foundations probably supporting health R & D and those probably not supporting it.

A complete description of the computer searches is contained in Appendix B.

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*And in a few cases prior knowledge about the activities of some foundations.

3.1.3 ENUMERATION AND LISTING OF THE FOUNDATIONS IN EACH STRATUM

In order to estimate the number of foundations in each stratum and to ensure that each foundation had a known probability of being included in the actual sample, a complete listing of all foundations in each of the strata was compiled. Two major references sources were utilized in compiling this listing. A summary list was produced from the Directory data file which contains information concerning the name, location, assets, total grants and number of grants for more than 2500 foundations. This file contains all foundations in Strata I and II, 1200 Stratum III foundations, and 700 Stratum IV foundations.* A complete listing of the foundations with total grants over $4 million and the foundations with total grants of $500,000 or more but less than $4 million was easily culled from this data file.

The Directory file also contains approximately 1200 foundations falling into Stratum III (total grants between $75,000 and $500,000). However, any foundation in this stratum which did not have assets of at least $1 million would not have been included in the file. Therefore, it was necessary to supplement this list with information from the National Data Bank File in order to obtain a complete list of Stratum III foundations that was independent of asset size.

Although the National Data Bank contains the most complete list of the more than 27,000 foundations in the universe, it does not con-

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*Inclusion in the Directory files depends on either assets of $1 million or more or total grants of $500,000 or more. Since the lower limit for total grants for Stratum II was set at $500,000, all of Strata I and II are included in the Directory.

tain the one piece of information crucial for stratification — total grant dollars for each foundation. Instead, qualifying distribution totals are given for each foundation. This figure is the sum of all distributions made during the year to satisfy the minimum distribution laws imposed on all foundations, including all grant dollars paid out plus all other administrative outlays during the year. We analyzed the relationship between total grants and qualifying distribution for a sample of 40 foundations in Stratum III. It was found that, on the average, grants account for approximately 89% of the qualifying distributions. We used 89% of a foundation's qualifying distribution as a proxy for total grant dollars in order to compile a listing of all foundations in Stratum III.

The listing of Stratum III thus consists of: (1) all foundations whose grants were $75,000 or more but less than $500,000, as indicated by the Foundation Directory Data Bank, and (2) all foundations not included in the directory but whose "qualifying distributions" as reported in the National Data Bank are between $82,270 and $561,798.

The same methodology for supplementing the Directory Data Bank information that was utilized from Stratum III was used for Stratum IV, for the Directory file contains information on only 700 Stratum IV foundations whose assets are valued at $1 million or more. Because there are over 24,000 Stratum IV foundations, we did not compile a complete list of Stratum IV foundations; rather a random sample of Stratum IV foundations was computer-generated and listed.

As a result of the enumeration and listing procedures we are able to estimate the number of foundations in each of the seven strati-

fication cells. These are shown in Table I, on page 25.

3.1.4 SAMPLE SIZES FOR REVIEW OF AVAILABLE GRANT DATA

For purposes of preliminary estimating the support for health R & D in each of the stratification cells and in the universe of private non-profit foundations as a whole, a sample of over 100 foundations in each of these seven cells was deemed sufficient. The normal distribution gives a pretty good approximation to the binomial distribution (the probability of a dichotomous variable) if the sample size times the probability is greater than 5. If the underlying probabilities of interest are as low as .05, the exploratory sample of about 100 enables us to assume normality even for a dichotomous variable. There were several departures from this sample size of 100:

- Stratum I has in total only 53 foundations; it is not possible to sample 100 foundations from this stratum.
- For five foundations in Stratum II and two in Stratum III information on grants could not be located. These foundations were not replaced in the sample.
- An additional 68 foundations was sampled from Stratum II because this stratum accounts for a large percentage of total grant dollars and because, in general, the necessary information on Stratum II foundations is readily available.

The final sample sizes for the review of available grant data are presented in Table II, shown on page 26.

The actual foundations whose grants were reviewed were randomly sampled (systematically) from the complete lists of foundations compiled for each of the strata and stratification cells.

TABLE I

ESTIMATED NUMBER OF FOUNDATIONS IN EACH STRATIFICATION CELL

STRATUM	NUMBER OF FOUNDATIONS	
Stratum I	53	
Stratum II	488	
Identified as probably supporting health R & D		193
Not identified as probably supporting health R & D		295
Stratum III	2,174	
Identified as probably supporting health R & D		293
Not identified as probably supporting health R & D		1,881
Stratum IV	24,197	
Identified as probably supporting health R & D		1,197
Not identified as probably supporting health R & D		23,000
Total Strata I-IV	26,923	
Stratum I		53
Identified as probably supporting health R & D		1,683
Not identified as probably supporting health R & D		25,176

TABLE II

FINAL SAMPLE SIZES FOR GRANTS REVIEW BY STRATUM

STRATUM	NUMBER OF FOUNDATIONS IN SAMPLE	
Stratum I	53	
Stratum II	268	
Identified as probably supporting health R & D		144
Not identified as probably supporting health R & D		124
Stratum III	195	
Identified as probably supporting health R & D		97
Not identified as probably supporting health R & D		98
Stratum IV	198	
Identified as probably supporting health R & D		98
Not identified as probably supporting health R & D		100
Total Strata I-IV	714	
Stratum I		53
Identified as probably supporting health R & D		339
Not identified as probably supporting health R & D		322

3.1.5 DATA SOURCES FOR THE GRANTS REVIEW

There are three main sources for descriptive material on foundation grants: (a) annual reports published by the foundations, (b) special reports on certain foundations contained in The Foundation Center Source Book, and (c) microfiches of foundation 990-AR and/or 990-PF forms. The first two sources are generally more useful for grant analysis than the microfiches of the I.R.S. forms, for they contain more descriptive material on each foundation grant. In many cases the grants list contained in the 990 forms listed just the name of the recipient and the amount of the grant, without any indication of the purpose or focus of the grant.

The vast majority of Stratum I foundations published annual reports covering 1974, many of which are reproduced in The Source Book. We were able to locate annual reports for 46 out of 53 Stratum I foundations; for the other nine foundations it was necessary to rely on the grants list contained in the foundations' 990 forms for review purposes. Sixty of the 268 Stratum II foundations published annual reports covering the year 1974 which were used for review purposes; we used microfiches of IRS 990 forms for analysis of the grants of the remaining 208 Stratum II foundations. For Stratum III and IV foundations microfiches of I.R.S. 990 forms were almost exclusively used.

We were not able to locate descriptive material on foundation grants in 1974 for 43 of the 714 foundations in the sample. For these foundations 1973 or 1975 grant data was utilized. However the dollar amounts of the grants of these foundations were corrected for calendar

year by multiplying them by an appropriate adjustment factor. These adjustment factors were developed on the basis of a sample of 18 foundations for which 1973, 1974 and 1975 grant data was available. For this sample of foundations it was found that the total grants dollars in 1973 amounted to 75% of the total grant dollars in 1974 and the total grant dollars in 1975 amounted to 110% of the total grant dollars in 1974. The grant dollar figures for the 43 foundations were adjusted upward by multiplying them by 1.33 (i.e. 100/75, using 1974 as the base year and equating it with 100%) when we had 1973 data available, and were adjusted downward by multiplying them by 0.909 (i.e. 100/110, using 1974 as the base year and equating it with 100%) when we had 1975 data available.

3.1.6 GRANT LIST REVIEW PROCEDURES

Grants lists of foundations which had been selected on the basis of the stratified sampling scheme were systematically reviewed for the year 1974. If 1974 data was not available, 1975 or 1973 data was substituted. The annual reports of foundations available at The Foundation Center and the special and annual reports contained in The Source Book were consulted first. If we could not find material on a foundation's 1974 grants in either of these two sources, then IRS 990 forms on microfiche were utilized.

For purposes of the review of available data (and the foundation survey to be described later) "the year 1974" was defined as the calendar year 1974 — from January 1 to December 31, 1974. When a foundation's fiscal year did or does not coincide with the calendar year, we

selected for review the foundation's fiscal year which included the bulk of calendar year 1974. For example, if a foundation's fiscal year ends at the end of May, we selected for review the grants list of fiscal year 1975 which includes the bulk (i.e. seven months) of calendar year 1974. If a foundation's fiscal year ends at the end of June, fiscal year 1974 data was selected.

The foundations' grants lists were reviewed to determine:

- The total dollar amount of grants which the foundation made (i.e. paid out) in 1974.
- The total dollar amount of grants which the foundation made in 1974 specifically for the purposes of health research and development.
- The individual grants which the foundation made for health R & D, including:
  - The dollar amount of each grant.
  - The type of recipient or performer (e.g. academic institution, private non-profit, State or local government, etc.).
  - The focus of the grant (i.e. biomedical, delivery, or other research).

Refunds made to the foundation for grants made out in previous years were also recorded. These were subtracted from the total dollar amount of grants paid out during 1974 and, if appropriate, of grants

paid out during 1974 for the purposes of health R & D in order to arrive at a total dollar figure for each of these categories. If a grant was described as being multipurpose; for example, for "research and training", only the portion of the grant which falls in the category of health R & D was treated as "health R & D" (e.g. for purposes of determining the total dollar amount of grants paid out by the foundation in 1974 specifically for the purposes of health R & D). If the grant was not described in enough detail to enable us to determine the dollar amount attributable to health R&D per se, we arbitrarily considered a percentage of the total multipurpose grant as health R&D. This percentage was determined by dividing the number of grant "purposes" which fall into the category of health R & D by the total number of "purposes" described for the multipurpose grant. For example, if a grant was described as being for the purposes of "medical research, training, and construction of medical laboratories", only one of the three grant "purposes" (i.e. medical research) can be considered to be health R & D. If the grant amounted to $75,000 only one third of it — $25,000 — was counted as health R & D.

Whenever there was a reasonable doubt as to our ability to classify a particular grant as "health R & D", the grant was recorded under the category or heading of "in doubt." For each foundation which had grants "in doubt", a calculation was made of the total dollar amount of the "in doubt" grants which could possibly be for the purposes of health R & D. All grants to medical schools, academic institutions, hospitals, health agencies, etc. were counted in this dollar figure, but grants to recipients not at all connected with the field

of health (e.g. Boy Scouts, legal aid societies, etc.) were excluded. We refer to the total dollar amount of "in doubt" grants for a foundation which can conceivably be for the purposes of health R & D as the foundation's "maximum exposure."

Several different types of grants lists were commonly found. Some lists contained very detailed descriptions of the grants which made it extremely easy to classify the grants. Some lists contained a blanket statement which described all grants as being for the general operating expenses of the recipients, which automatically precluded their being health R & D grants according to our definition.

These two types of lists pose no extensive problems with respect to grants classification. However, some lists are organized in such a way that serious problems did arise with classification. Some foundations list their grants by broad category, such as health or medical grants, in which case we classified all grants in the category as "in doubt." Additionally, especially in the lower strata, the grants list contained no information except the recipient's name; this made classification totally impossible, and again we were forced to classify the grants as "in doubt." Sometimes a foundation described a group of grants as being for the purposes of health or medical research. We classified all these grants as health R & D unless additional descriptive information indicated that this was inappropriate. Some error is bound to have occurred by this procedure, because we were being forced to use the foundation's own definition of health R & D in classifying the grants.

3.2 FINDINGS OF REVIEW OF AVAILABLE GRANT DATA

The major areas of findings in connection with the review of the grants list of the 714 foundations in the sample are: a determination of the percentage of foundations who support health R & D; the estimation of the total dollars devoted by foundations to health R & D; the estimation of the total dollars devoted by foundations to health R & D; and the breakdown of foundation support for health R & D by the grant focus and by the type of recipient. These findings will be discussed in turn.

3.2.1 ESTIMATION OF THE PERCENTAGE OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

Since all stratum samples were drawn randomly and can be considered representative of the stratum, the distribution of a stratum sample can be used as an approximation of the distribution of the universe of foundations in the stratum. Table III, on the following page, shows the actual distribution of the foundations in the sample in each stratum, as well as the estimated distribution of the universe in terms of support of health R & D.

It is estimated that approximately 6% of all foundations in the universe made grants in support of health R & D during 1974. Approximately 58% did not make any such grants. The remaining 36% of foundations, however, cannot be classified on the basis of the available information as to whether they made health R & D grants in 1974.

TABLE III

PERCENT OF FOUNDATIONS THAT SUPPORT HEALTH R & D*

	Distribution of Sample			Estimated Distribution of the Universe		
STRATUM	1	2	3	1	2	3
Stratum I	68	25	8	68	25	8
Stratum II	32	38	30	26	42	32
Foundations identified as probably supporting health R & D	51	25	24	51	25	24
Foundations not identified as probably supporting health R & D	10	53	37	10	53	37
STRATUM III	19	42	39	15	48	37
Foundations identified as probably supporting health R & D	25	34	41	25	34	40
Foundations not identified as probably supporting health R & D	13	50	37	13	50	37
STRATUM IV	12	49	39	5	60	35
Foundations identified as probably supporting health R & D	19	38	48	19	38	43
Foundations not identified as probably supporting health R & D	4	61	35	4	61	35
Total STRATA I-IV	25	41	33	6	58	36
Foundations identified as probably supporting health R & D	39	30	31	25	35	39
Foundations not identified as probably supporting health R & D	9	55	36	5	60	35

Legend:

1 Percent of foundations which actually support health R & D, based on review of available grant data.
2 Percent of foundations which do not support health R & D, based on review of available grant data.
3 Percent of foundations whose support of health R & D could not be determined, based on review of available grant data.

*In this and all subsequent tables total percentages may not equal 100.0% because of rounding errors.

3.2.2 ESTIMATION OF THE TOTAL FOUNDATION GRANT DOLLARS DEVOTED TO HEALTH R & D

For each stratification cell we calculated the total and the mean health R & D grant dollars in the sample drawn from the cell excluding grants which were "in doubt" — as well as the variance of the mean. The total health R & D dollars in each sample were then multiplied by the ratio of the cell population to the sample drawn from the cell and then summed over all cells in order to arrive at an estimate of health R & D grant dollars for the entire universe. For example, in the stratification cell of "Stratum II - foundations identified by searches as probably supporting health R & D" the total health R & D grant dollars for the sampled foundations was $10,281,644. This total was then multiplied by 1.34 (the ratio of the total population of the stratification cell to the sample size drawn from the cell — 193/144). The resulting figure of $13,780,259 was then added to the weighted estimates from the other stratification cells in order to arrive at an estimate of foundation support for health R & D in the entire universe. The estimates for each of the stratification cells and for the entire universe are presented in Table IV.

It should be noted that these estimates are only accurate to the extent that there are actually no health R & D grants in the category of grants which were classified as "in doubt". Undoubtedly, this is not the case. We therefore estimated for each stratification cell the total "in doubt" grants which could possibly be for health R & D.

TABLE IV: ESTIMATED DOLLAR AMOUNTS OF HEALTH R & D GRANTS BY STRATUM

(IN THOUSANDS OF DOLLARS)

Stratum	1	2	3	4	5
I	$ 28,138	51%	-	-	$ 28,138
II	$ 13,780	25%	$ 1,709	3%	$ 15,138
III	$ 3,250	6%	$ 4,128	8%	7,378
IV	$ 3,623	7%	$ 203	.4%	3,826
Total	$ 48,791	89%	$ 6,040	11%	$ 54,831

Legend:

1 Foundations identified by searches as probably supporting health R & D

2 Percent of total health R & D dollars

3 Foundations not identified by searches as probably supporting health R & D

4 Percent of total health $ & D dollars

5 Total

Table V presents the detailed results of the review of available grant data including the total health R & D $, the means, health R & D $, the variance of the mean, and the "maximum exposures"* for each strati-

*The total "maximum exposure" in the sample of a particular stratification cell was multiplied by the ratio of all population to the sample drawn from the cell in order to estimate the "maximum exposure" for the stratification cell population as a whole.

TABLE V*

DETAILED RESULTS OF REVIEW OF AVAILABLE GRANT DATA

UNIVERSE ESTIMATES OF MEANS AND STANDARD DEVIATIONS OF HEALTH $ & D $ OF FOUNDATIONS IDENTIFIED AND NOT IDENTIFIED AS PROBABLY SUPPORTING HEALTH R & D __ INCLUDING ESTIMATES FOR FOUNDATIONS "IN DOUBT" AND ESTIMATED NUMBER OF FOUNDATIONS NOT SUPPORTING HEALTH R & D.

STRATA				
I	Yes 36	$\sum$ = $28,137,793	mean	= $ 833,072
	No 13		std. dev.	= 2,205,406
	In Doubt 4	Max. exp. = 14,216,564	mean	= 3,554,141
	n = 53		std. dev.	= 3,831,385

II	IDENTIFIED BY SEARCH	NOT IDENTIFIED BY SEARCH	TOTAL
Yes	73 $\sum$ = $10,281,644	12 $\sum$ = $718,400	85 $\sum$ = $11,000,044
No	36 $\bar{X}$ = 140,844	66 $\bar{X}$ = 59,867	102 $\bar{X}$ = 129,412
In Doubt	35 S.D. = 263,742	46 S.D. = 73,075	81 S.D. = 248,306
n =	144 out of 193	124 out of 295	268 out of 488
Contribution	$13,780,259	$ 1,709,097	$15,489,356
Max. Exp.	6,426,684	14,148,378	20,575,062
Mean Exp.	131,208	133,546	
S.D. Exp.	99,869	158,042	

III			
Yes	24 $\sum$ = $ 1,075,933	13 $\sum$ = $215,055	37 $\sum$ = $ 1,291,018
No	33 $\bar{X}$ = 44,831	49 $\bar{X}$ = 16,699	82 $\bar{X}$ = 34,872
In Doubt	40 S.D. = 40,727	36 S.D. = 38,983	76 S.D. = 38,516
n =	97 out of 293	98 out of 1881	195 out of 2174
Contribution	$ 3,249,983	$ 4,127,739	$ 7,377,722
Max. Exp.	7,405,007	45,695,050	53,100,057
Mean Exp.	61,042	62,591	
S.D. Exp.	74,710	93,895	

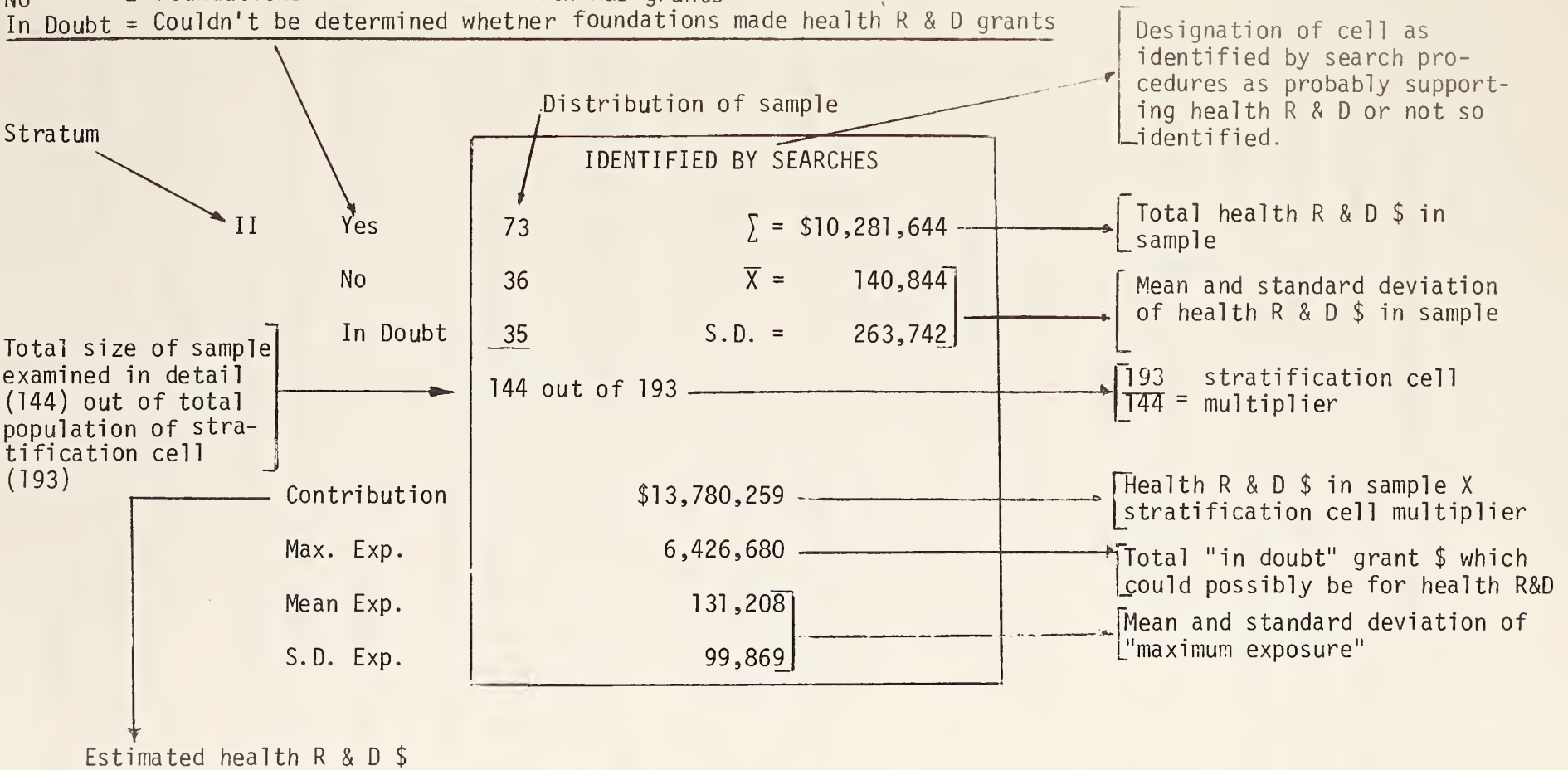
IV			
Yes	19 $\sum$ = $ 296,615	4 $\sum$ = $ 885	23 $\sum$ = $ 297,500
No	37 $\bar{X}$ = 15,611	61 $\bar{X}$ = 221	98 $\bar{X}$ = 12,935
In Doubt	42 S.D. = 22,156	35 S.D. = 232	77 S.D. = 21,061
n =	98 out of 1197	100 out of 23,000	198 out of 24,197
Contribution	$ 3,622,940	$ 203,550	$ 3,826,490
Max. Exp.	2,704,793	20,707,130	23,411,923
Mean Exp.	5,286	2,572	
S.D. Exp.	11,024	4,469	

$\sum$ Yes TOTALS	152 $\sum$ = $41,644,770	29 $\sum$ = $934,370	181 $\sum$ = $42,579,140
$\sum$ No	119	176	295
$\sum$ In Doubt	121	117	238
n =	392 out of 1736	322 out of 25,176	714 out of 26,912
$\sum$ of contribution	$48,790,975	$ 6,040,386	$ 54,831,361
$\sum$ of Max. Exp.	30,753,048	80,550,558	111,303,610
	79,544,023	86,590,944	166,134,971
	(Includes Stratum I)		

*For detailed information concerning interpretation of the data presented here, see the following page.

HOW TO INTERPRET TABLE V

Yes = Foundations which had health R&D grants
No = Foundations which had no health R&D grants
In Doubt = Couldn't be determined whetner foundations made health R & D grants


Stratum
II
Distribution of sample
Yes
No
In Doubt
IDENTIFIED BY SEARCHES
73
36
35
∑ = $10,281,644
X̄ = 140,844
S.D. = 263,742
144 out of 193
Designation of cell as identified by search procedures as probably supporting health R & D or not so identified.
Total health R & D $ in sample
Mean and standard deviation of health R & D $ in sample
193 stratification cell
144 = multiplier
Total size of sample examined in detail (144) out of total population of stratification cell (193)
Contribution
$13,780,259
Health R & D $ in sample X stratification cell multiplier
Max. Exp.
6,426,680
Total "in doubt" grant $ which could possibly be for health R&D
Mean Exp.
131,208
S.D. Exp.
99,869
Mean and standard deviation of "maximum exposure"
Estimated health R & D $ of cell population

fication cell and for the total universe. We estimate that the total foundation support for health R & D in the year 1974 is minimally $55 million, and possibly as high as $166 million. The grant data available does not permit a more precise estimate to be made.

3.2.3 ANALYSIS OF FOUNDATION SUPPORT FOR HEALTH R & D IN TERMS OF FOCUS OF GRANT AND TYPE OF RECIPIENT

The grant data collected for the sample of 714 foundations was also classified by focus of the grant (e.g. biomedical, delivery, or other health R & D) and by type of grant recipient. Detailed tables showing the distribution of health R & D grant dollars by grant focus and type of recipient for each stratum are presented in Appendix C.

The major findings of the analysis of foundation support for health R & D in terms of grant focus and type of recipient are:

- The bulk of all health R & D grant money goes to academic institutions (including medical schools) and to other non-profit organizations. These two categories account for 88% of all health R & D grant dollars.

- Approximately 10% is given to foreign performers and 2% is spent internally. A negligible amount is given to industry, or to Federal, State or local government.

- 65% of all grant money is for biomedical research, 20% is spent on "other" health related R & D, and 15% is spent on delivery R & D.

- The percentage breakdown of grant dollars by focus is fairly consistent across stratification cells except that "Stratum III - identified by the searches" and Stratum IV - identified by the searches" have unusually high percentages of grant dollars devoted to biomedical R & D, and "Stratum III - not identified" is high in "other" health R & D.

- The foundations which were identified as probably not supporting health R & D account for 9% of all biomedical dollars, 12% of all delivery dollars, and 21% of all "other" health dollars, despite the fact that they account for only 11% of all health R & D grant dollars.

- Medical school grants account for approximately a third of all academic grants and are primarily (85%) biomedical in focus.

3.3 COMPARISON OF COOPER AND COMPANY AND D.R.A. ESTIMATES OF FOUNDATION SUPPORT FOR HEALTH R & D

The D.R.A. currently analyzes the grants of 37 foundations; it bases its estimates of health R & D grant dollars on the grant activities of 24 of these foundations. During the present review of available grant data by COOPER AND COMPANY the grants lists for 1974 for 36 of the foundations which DRA follows were analyzed. Table VI presents a detailed comparison of the health R & D grant dollars for each of these foundations as estimated by COOPER AND COMPANY and by D.R.A.

There were substantial differences between the two sets of estimates. COOPER AND COMPANY estimated that these 36 foundations made $33

TABLE VI

COMPARISON OF DRA AND COOPER AND COMPANY ESTIMATES OF HEALTH R & D DOLLARS IN 1974 FOR 36 FOUNDATIONS

Foundations in Stratum I	Initial COOPER AND COMPANY Estimate	DRA Estimate	Initial COOPER AND COMPANY estimate as % of DRA estimate
Bush	$ 199,276	$ 276,028	72%
Cleveland*	198,975	412,701	48%
Commonwealth	176,312	310,205	57%
Duke	7,000	371,447	2%
Fleischmann	214,347	618,102	35%
Ford*	11,538,239	22,555,441	51%
Hartford*	6,111,491	6,111,491	100%
Robert Wood Johnson*	1,085,947	1,387,452	78%
Kellogg	2,170,412	2,419,041	90%
Moody*	44,880	321,776	14%
Northwest Area*	176,698**	308,847	57%
Penn	182,097**	100,125	182%
Rockefeller Brothers*	100,000	29,500	329%
Rockefeller*	2,967,709	5,730,234	52%
Scaife	75,000	125,000	60%
Sloan*	536,715	771,750	70%
STRATUM I TOTAL	$25,785,098	$41,849,140	62%

*Foundations in D.R.A. "pool"

**1975 data

TABLE VI (continued)

Foundations in Stratum II	COOPER AND COMPANY Estimate	DRA Estimate	COOPER AND COMPANY as % of DRA
Child's Memorial*	$ 807,897	$ 807,938	100%
China Medical Board*	387,865	306,044	122%
Clayton*	0	0	100%
Foundation for Child Development*	108,414	183,986	59%
Gleason	15,000	152,500	10%
Grant*	1,629,300	2,685,744	61%
Kaiser	209,050	308,750	68%
Kettering*	0	1,427,462	0%
Kroc	612,513	770,597	79%
Markle*	0	0	100%
Milbank	172,790	213,579	81%
Pardee*	262,919	269,406	98%
Research Corporation*	550,599	1,002,506	55%
Rippel*	537,843	693,034	78%
Van Ameringen	236,677	241,675	98%
Whitehall*	319,362	521,585	61%
Whitney*	566,145	588,645	101%
STRATUM II TOTAL	$6,401,374	$10,143,451	63%
Foundations in Stratum III			
Fels Fund*	0	0	100%
Schleider*	386,637**	451,595	86%
Sprague Memorial*	313,500	223,500	140%
STRATUM III TOTAL	$ 700,137	$ 675,095	104%
TOTAL	$32,886,609	$52,667,686	62%

*Foundation in D.R.A. "pool"
**1975 data

million in health R & D grants while DRA estimated $53 million in grants. The COOPER AND COMPANY estimates were essentially the same as DRA figures for five foundations, and were very close in the case of three other foundations. For four foundations COOPER AND COMPANY estimates were substantially higher than DRA figures, while for the remaining 24 foundations COOPER AND COMPANY estimates were substantially lower.

There are three major reasons why there is such a wide discrepancy between the two sets of estimates:

- COOPER AND COMPANY made major revisions in the (operational) definition of health R & D, particularly in the areas of environmental research and social-psychological research. These revisions tend to restrict the type of research studies which can be classified as health R & D. The DRA estimates predate these revisions.

- Some differences in classification of the grants as either health R & D or not health R & D may be a function of judgmental differences between the individuals doing the classification. In many specific cases, if one or two words in a grant description are interpreted slightly differently by two people, the grant may be classified differently by them.

- Foundations vary from year to year in the grant dollars allocated to health R & D. For three of the 36 foundations we were unable to locate 1974 grant data and had to substi-

tute 1975 data.

3.4 CONCLUSIONS TO BE DRAWN FROM REVIEW OF AVAILABLE GRANT DATA

The review of available grant data yielded valuable information about the distribution and level of foundation support for health R & D. Approximately 6% of private non-profit foundations supported health R & D in 1974 and 58% definitely did not support health R & D. However, based upon publically available information it is impossible to determine whether the remaining 36% of foundations support health R & D activities. Assuming that all of these foundations did not make any health R & D grants, the total health R & D dollars in the universe is estimated to have been approximately $54 million in 1974. The "in-doubt" grants, however, could add as much as $111 million to that estimate, depending on what proportion of the "in-doubt" grants were health R & D related. Without special research efforts (i.e. a survey of foundations) it is virtually impossible to accurately estimate the total foundation support for health R & D.

Several other major conclusions may be drawn on the basis of the information gathered during the data review. First, the stratification scheme, as developed originally, appears to be highly useful in reducing the sample variance and arriving at a more accurate estimate of health R & D grant dollars. Second, the searches of the Foundation Center computer files to identify those foundations which probably support health R & D also appears to be a highly useful technique for sampling purposes. In fact, the foundations which were identified by computer search techniques as probably supporting health R & D account for

almost 93% of the estimated health R & D grant* dollars in 1974 in Strata II, III and IV.

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*I.e., only those grants which could definitely be identified as being for the purpose of health R & D. Grants which were classified as "in doubt" are not included in the calculation of this percentage.

4 DESIGN AND EXECUTION OF SURVEY OF FOUNDATIONS

The review of available grant data disclosed that it is virtually impossible to accurately estimate foundation support for health R & D without a special survey of foundations. The purpose of this survey would be not only to allow the accurate estimation of foundation grants for the particular year covered by the survey, but also to establish a "bench mark" against which the accuracy of estimates obtained in other fashions can be measured. In this section we describe the development and pretest of a special mail survey of foundations designed to achieve these and other research goals, the design of an appropriate sampling and stratification plan, and the execution of the actual survey itself.

4.1 SURVEY DEVELOPMENT

4.1.1 MAJOR DESIGN CONSIDERATIONS

There are four major survey objectives, as delineated by the RFP for the present study, which guided the construction of the survey instrument. Briefly stated, the special survey of foundations was aimed at:

- Collecting sufficient information concerning specific foundation grants to permit refinement of the initial estimates of health R & D grant dollars for the entire universe of foundations.

- Collecting information about the distribution of health

R & D dollars by focus of the grant and type of recipient.

- Assessing the stability of support for health R & D and the degree of committment to this field of interest compared to other areas of foundation interest.

- Examining the nature of the grant decision-making process and other factors potentially influencing support for health R & D activities specifically from the viewpoint of being able to predict future foundation support for health R & D.

The number of foundations to be sampled — 200 — and their scattered geographic location necessitated that the survey be conducted by mail if costs were to be kept at a reasonable level. It was hoped that a high response rate would be achieved by:

- Stressing NIH sponsorship of the research, explaining the importance of the survey, and assuring foundation confidentiality in a cover letter to accompany the survey.

- Reducing respondent burden by not asking foundations to provide information which was readily available through other sources, by not asking overly detailed questions, etc.

- Designing clearly worded questions with exhaustive response categories that are logically organized and presented in a visually appealing manner.

- Developing follow-up procedures for contacting foundations which did not initially respond to the survey and for urging foundation response.

4.1.2 INITIAL INSTRUMENT DESIGN

The survey instrument which was developed to meet the objectives described above was composed of four parts. The first section requested information concerning the level of support for health R & D by the foundation, the stability of this support (i.e. whether there have been changes in the level of funding of health R & D activities by the foundation in the past few years), and the relative commitment of the foundation to support health R & D. The second section dealt with the factors which influence the level of funding for health R & D by the foundation, including the proposal evaluation, budget allocation and grant decision-making processes. The third part of the survey concerned grants which the foundation had made during 1974; specifically the foundation was asked whether given grants the foundation had made were restricted to health R & D activities, the focus of these grants, and the type of grant recipient. Finally, the foundation was given space to provide additional information relevant to understanding the foundation's support for health R & D. A detailed page of instructions and definitions, and a cover letter, accompanied the instrument.

Although as a result of the pretest experience major revisions were made in the format and language of specific questions, instructions and definitions, the basic structure of the survey has remained

the same.

4.1.3 PRETEST OF THE MAIL SURVEY

4.1.3.1 PRETEST PROCEDURES

The survey instrument was pretested by having representatives of nine foundations (e.g. foundation staff member) complete and/or comment upon the initial survey. The nine foundations were chosen* so that all four strata and both foundations which were identified as probably supporting health R & D and those which were not so identified were represented. The estimated level of support for health R & D of the nine foundations varied from zero dollars to over one half million dollars. Prior to each interview we prepared a list of grants which the given foundation made in 1974 which could possibly have been for health R & D.** These lists were based upon information contained in The Foundation Directory and I.R.S. 990 AR and PF forms. The grants

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*A small number of foundations in each stratification cell which were located in New York City and Western Connecticut were randomly selected. The foundations were contacted by telephone; the contact involved a brief explanation of the overall purpose and sponsorship of the research and a request to review the initial survey with someone knowledgeable about the foundation's policy and program. Generally only one attempt was made to contact each foundation and about one call out of three resulted in an interview. There were various reasons why we were unable to conduct interviews with all the remaining foundations which we contacted. Several foundations appeared willing to cooperate but did not have any personnel available to meet with us. Some foundations apparently did not understand the purpose of our call and requested that we first write a letter to them. Some simply said they weren't interesting in cooperating in the research effort.

**If the number of grants which possibly could have been for health R & D exceeded twenty, only a random sample of twenty of these grants was prepared.

list constituted the third part of the survey.

During each interview we noted any difficulties the respondent had in responding to any of the questions, understanding any of the instructions or definitions, etc. Additionally, we asked the respondent whether in his opinion, the foundation would respond to the survey were it received through the mail and what effect NIH and/or Foundation Center sponsorship of the research (to be explicitly stated in a covering letter to be sent along with the survey) would have on the tendency to respond to the survey. The time it took the respondent to read and complete the survey and accompanying material was also noted.

Prior to submitting the survey to OMB for clearance, the instrument was also reviewed by staff members of the Foundation Center and by D.R.A. personnel.

4.1.3.2 PRETEST FINDINGS AND REVISIONS IN SURVEY INSTRUMENT

As a result of the pretest experience substantial revisions were made in the survey. The major pretest findings and consequent instrument changes are noted below:

- Since many of the recipients started to complete the survey without first reading the accompanying definitions, the definitions were included as part of the first set of instructions for the survey. In order to permit the respondents to more easily refer to the definitions while they complete the questions about the grants list, the definitions are also repeated on a separate insert.

- Because of the relatively small number of surveys which would have to be edited it was decided that having the respondents code their own answers to survey questions (e.g., having them record a "1" for a "YES" answer and a "2" for a "NO" answer) was unnecessary. The respondents would be asked to either fill in or circle the correct response. The pretest respondents viewed having the respondents code their own answers as being time consuming and confusing.

- The response categories to several of the survey questions did not adequately cover the response possibilities. Additional response categories (including the category of "Other" with a blank space next to it for amplification) were added to the questions covering factors influencing the level of funding for health R & D, fields of interest of the foundation and the proposal evaluation and grant decision-making processes.

- Several respondents commented that the survey appeared to be overly "cluttered" and lengthy. The instrument was reformatted and then photostatically reduced in order to create a more spacious visual effect and to decrease the apparent length of the instrument.

In addition to these revisions the wording and phrasing of a number of questions was changed as a consequence of the pretest experience.

It took the pretest respondents approximately one-half hour to complete the survey. Although everyone who was interviewed stated that their foundation would definitely complete the survey, it should be noted that the sample of respondents is a highly biased one, consisting of people who had already agreed to cooperate in the research effort. The respondents felt that NIH sponsorship of the survey — explicitly stated in a cover letter — would increase response to the survey; several respondents, however, felt that Foundation Center sponsorship of the survey would have a deleterious effect upon the response rate to the survey.

The final survey instrument, approved by O.M.B. for use in the present study, and the cover letter which ultimately accompanied the survey, follow.

4.2 SAMPLING AND STRATIFICATION PLAN DESIGN

In developing the sampling and stratification plan for the mail survey of foundations we must be cognizant of the fact that there is a fundamental conflict between the need to accurately estimate the level of foundation support for health R & D activities and the need to describe the types of foundations which support health R & D (versus those that do not) and elucidate the factors which influence or are associated with such support. The former need dictates that we sample only those foundations which definitely have made health R & D grants or have grants that are "in doubt".* The latter need leads us to the

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*If we can determine on the basis of available data that a foundation

footnote continued ...

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH
BETHESDA, MARYLAND 20014

May 31, 1977

The National Institutes of Health (NIH) has for a number of years collected data on private U.S. foundation support for health research and development in an effort to accurately estimate annual support and to project the general level of likely support into the near future. The National Institutes of Health has contracted with Cooper and Company, a management consulting firm in Stamford, Connecticut, to conduct a survey designed to improve the NIH estimations and methodologies in this area. The enclosed questionnaire is designed to obtain information that will help us identify any necessary improvements.

Your organization has been included in a scientifically-selected sample of over 200 foundations that has been prepared by Cooper and Company. Your answers are very important to the accuracy of our research whether or not you provide support for health research and development activities. It is not the objective of NIH to obtain information on any individual foundation and no personal identifying information will be transmitted to NIH. The data to be collected by Cooper and Company will be used only for statistical purposes to provide NIH with a composite picture, and personal identifiers will be destroyed by them when the study has been completed. The confidentiality of your response is contractually guaranteed by agreement between Cooper and Company and NIH.

Your participation and cooperation will be of considerable assistance and of critical importance to our continuing efforts to improve our understanding of support for health R & D in different sectors of our national economy. We earnestly hope you will join with us in this endeavor. Please return the completed questionnaire to Cooper and Company in the stamped, addressed envelope before June 15, 1977.

Mr. Bernard N. Samers of Cooper and Company would be happy to answer any specific questions you may have on the attached material. He can be reached at Area Code (203) 325-1575.

Sincerely yours,

Thomas E. Malone

Thomas E. Malone, Ph.D.
Deputy Director
National Institutes of Health

Enclosures

OMB NO: 68-S77018 Expiration date 9/30/77

SURVEY ON FOUNDATION SUPPORT FOR HEALTH RESEARCH AND DEVELOPMENT

ID

Please familiarize yourself with the general definition of HEALTH RESEARCH AND DEVELOPMENT (R&D) given below. It is very important that this definition be kept in mind when answering all of the questions. This definition is repeated on the blue sheet along with several other definitions you may want to refer to in completing the questionnaire.

HEALTH RESEARCH AND DEVELOPMENT (R&D) - includes the following three general categories of research and development:

A. BIOMEDICAL R & D - Research on mental or physical diseases (e.g., causes, cures, prevention); Research on life processes (e.g., biology, genetics); Research on assistance devices and surgical techniques.

B. HEALTH DELIVERY R & D - Research on the organization, delivery, utilization and financing of health care, including development of new forms of health manpower and training.

C. "OTHER" HEALTH RELATED R & D - Includes a broad range of activities. Research on the impact of physical and man-made environments on human health; Nutritional research; Population research (e.g., demography, contraception); Research on psycho-social behavioral problems (e.g., deviance, juvenile delinquency).

R & D (RESEARCH AND DEVELOPMENT) - Systematic, intensive study directed toward fuller scientific knowledge or understanding, and systematic use of this knowledge and understanding in the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. Demonstration projects involving evaluation and innovation are included, but quality control, routine product testing, and production are not.

Support for R & D includes all direct, indirect, incidental or related costs resulting from or necessary to R & D. It does NOT include any of the following:

- Actual service or health care
- Construction of facilities (even if for research)
- Training (except when conducted as part of a specific research project or when it is specifically training in research)
- Implementation of Research and Development innovations.

Please try to answer all of the questions with your best estimate, whenever it is possible, including completing Part II, which is the yellow insert. Feel free to write any additional comments or amplifications of your answers anywhere on the form. An open-ended question is also included at the end where any other information relevant to understanding the foundation's level of support for HEALTH RESEARCH AND DEVELOPMENT is requested.

Please feel free to call Mr. Bernard N. Samers at (203) 325-1575 if you have any questions or problems with completing the questionnaire.

PLEASE (CIRCLE) THE CORRECT ANSWERS

PART I

1. Does your foundation have a written statement of program policy? YES (Please supply a copy) NO

2. Is your foundation specifically committed to supporting HEALTH RESEARCH AND DEVELOPMENT (R&D) activities?

YES NO (Skip to Q. 3)

2a. Is this committment a result of: (1) Policy (2) Specific restriction of funds as a result of endowment, etc., or (3) Other _____

3. Please estimate the total grant dollars paid out during 1974 which were specifically restricted for the purpose of HEALTH R & D activities. S_____

PLEASE (CIRCLE) THE CORRECT ANSWERS

4. Did your foundation perform any internal HEALTH R & D during 1974? (Internal is defined as research and development activities carried out by foundation personnel. It does not include activities of consultants or others involved with monitoring, assisting or administering grant activities.)

YES NO (Skip to Q. 5)

4a. What were the total dollar expenses for internal HEALTH R & D activities during 1974?
$_____

4b. Please indicate the approximate percentage of this total that was spent on each of the following three categories of HEALTH R & D:

BIOMEDICAL R & D: _____%
HEALTH DELIVERY R & D: _____%
"OTHER" HEALTH R & D: + _____%
100 %

(SEE DEFINITIONS ON BLUE INSERT)

5. Using HEALTH R & D grant dollars (Q. 3) and total internal HEALTH R & D expenses (Q. 4a) paid out in 1974 as a base figure (i.e. 1974 is 100%), what was the level of HEALTH R & D dollars paid out in 1972, relative to 1974 HEALTH R & D dollars?

LESS THAN OR EQUAL TO: MORE THAN:

0% (None in 1972)	25%	50% (half as much as 1974)	75%	100% (same as 1974)	125%	150% (half again as much as 1974)	175%	200% (twice as much as 1974)	200+%

(NOTE: If 1974 is $0, simply estimate total HEALTH R & D dollars in 1972. $_____)

6. Using HEALTH R & D grant dollars (Q. 3) and total internal HEALTH R & D expenses (Q. 4a) paid out in 1974 as a base figure (i.e. 1974 is 100%), what was the level of HEALTH R & D dollars paid out in 1976, relative to 1974 HEALTH R & D dollars?

LESS THAN OR EQUAL TO: MORE THAN:

0% (None in 1976)	25%	50% (half as much as 1974)	75%	100% (same as 1974)	125%	150% (half again as much as 1974)	175%	200% (twice as much as 1974)	200+%

(NOTE: If 1974 is $0, simply estimate total HEALTH R & D dollars in 1976. $_____)

7. What factors importantly influence the level of funding for HEALTH R & D by your foundation in any given year?

(1) Amount of gifts or contributions received
(2) Return on investment in prior years
(3) Change in interest to or from HEALTH R & D
(4) Foundation goals and objectives
(5) IRS Minimum Distribution Requirement
(6) Level of government support for HEALTH R & D
(7) Current public issues
(8) Number or quality of competitive requests for funding received
(9) Recent developments in the field of Health
(10) Other _____

SELECT UP TO 3 IN ORDER OF IMPORTANCE
1st _____
2nd _____
3rd _____

8. In which of the following general areas is your foundation actively granting support or sponsoring internal projects?

(1) Welfare
(2) Religion
(3) HEALTH R & D
(4) Health Other than R & D
(5) Humanities
(6) Sciences
(7) Educational Programs
(8) Other _____

SELECT UP TO 3 IN ORDER OF MAGNITUDE OF DOLLAR SUPPORT
1st _____
2nd _____
3rd _____

9. Are specific budget allocations drawn up by your foundation each year for various areas of funding? (Such as HEALTH R & D, educational scholarships, religious activities, etc.).

YES NO

PLEASE CIRCLE THE CORRECT ANSWERS

10. Are grant proposals or requests for funding for HEALTH R & D projects accepted for consideration by your foundation?

YES NO

11 Which of the following responses best describes who evaluates and who makes decisions about grants in your foundation? CIRCLE THE RESPONSE WHICH IS MOST NEARLY CORRECT.

11a. Evaluations and recommendations are made by:

(1) A single unpaid officer
(2) A small family group
(3) A single paid executive
(4) A paid staff of the foundation
(5) Outside consultants
(6) Both outside consultants and paid staff
(7) Other _____

11b. Final Grant Decisions are made by:

(1) A single unpaid officer
(2) A small family group
(3) A single paid executive
(4) A committee or committees of full-time foundation employees
(5) Outside consultants
(6) Board of Directors or trustees of the foundation
(7) Other _____

12. Please answer the following questions about how your foundation makes its allocation decisions with either a True or a False. Give the answer which is most nearly correct. There are no "right" answers, since every foundation may have individual decision criteria. If the questions and responses do not adequately portray your decision process, please feel free to describe exactly how decisions are made or to amplify your answers in the space provided below.

CIRCLE ONE FOR EACH STATEMENT

T F a. A limit is set each year on total foundation giving based on available dollars before requests for funds are considered.

T F b. Total foundation giving is based on broad, predetermined foundation objectives and goals.

T F c. Requests for funds from recipient organizations are sometimes reduced by the foundation before allocations are made.

T F d. Requests for funds are ordered by priority and dollars are allocated in priority order until no more funds are available.

T F e. At periodic intervals all requests are considered and weighed against each other simultaneously.

T F f. Sometimes available dollars are not allocated because enough acceptable requests which satisfy the foundation's goals are not forthcoming.

T F g. Each request is evaluated and decided upon independently of all other requests.

T F h. If there is an excess of worthy requests, some additional dollars are made available for allocation.

T F i. All foundation dollars are allocated at one point in time.

T F j. Tax laws on distribution have had a significant effect on how much the foundation allocates each year.

T F k. Revisions in the tax laws have resulted in effective liquidation or dormancy of the foundation.

T F l. The tax laws on distribution have led to significant changes in foundation investment policy

T F m. The tax laws have led to the utilization of capital to meet minimum distribution requirements.

Please provide any information which is relevant to understanding the foundation's level of support for HEALTH R & D which has not been brought out by the questions above. Use this space to amplify any of your responses given above.

_____

_____

_____

_____

_____

PLEASE CIRCLE THE CORRECT ANSWERS

PART II 1974 EXPENDITURES _____ ID _____ Total Grants 1974 _____

Below are listed some of your grants paid during 1974. We would like you to answer several questions concerning each grant listed. Work across the page, answering each question which is applicable. Definitions may be found on blue insert. Codes for the Type of Recipient are on the bottom of the page.

Grant Recipient Name and Address	Amount actually paid out in 1974	1. Was use of grant money restricted? CIRCLE ONE (If no, go to next grant)	2. Code type of recipient (See below) ENTER ONE	3. Was the grant restricted to Health R & D Activities? CIRCLE ONE	(If you cannot answer "Yes" or "No," please briefly describe the grant so that we may make a determination.)	4. If grant was Health R&D, Code major focus of grant below: BIOMEDICAL=1 DELIVERY=2 "OTHER" HEALTH=3
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		
		YES NO		YES NO		

TYPE OF RECIPIENT: (See Definitions on blue insert)
1. Internal
2. Medical Schools
3. Other Academic
4. Private Non-Profit Organizations (Includes individuals)
5. State and Local
6. Foreign
7. Federal Agencies
8. Industrial Firms

SURVEY ON FOUNDATION SUPPORT FOR HEALTH RESEARCH AND DEVELOPMENT

DEFINITIONS

1. HEALTH RESEARCH & DEVELOPMENT - includes the following three general categories of research and development:

   A. BIOMEDICAL R & D - Research on mental or physical diseases (e.g., causes, cures, prevention); Research on life processes (e.g., biology, genetics); Research on artificial assistance devices and surgical techniques.

   B. HEALTH DELIVERY R & D - Research on the organization, delivery, utilization and financing of health care, including development of new forms of health manpower and training.

   C. "OTHER" HEALTH RELATED R & D - Includes a broad range of activities. Research on the impact of physical and man-made environments on human health; Nutritional research; Population research (e.g., demography, contraception); Research on psycho-social behavioral problems (e.g., deviance, juvenile delinquency).

   R & D (RESEARCH AND DEVELOPMENT) - Systematic, intensive study directed toward fuller scientific knowledge or understanding, and systematic use of this knowledge and understanding in the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. Demonstration projects involving evaluation and innovation are included, but quality control, routine product testing, and production are not.

   Support for R & D includes all direct, indirect, incidental or related costs resulting from or necessary to R & D. It does NOT include any of the following:

   - Actual service or health care
   - Construction of facilities (even if for research)
   - Training (except when conducted as part of a specific research project or when it is specifically training in research.)
   - Implementation of R & D innovations.

2. GRANT DOLLARS - Actual dollars paid out on grants during the year regardless of when the grant was awarded or the duration of the grant. (For example: If a 5-year grant for $100,000 was awarded in 1970 and 1/5 of this was paid in 1974 - the grant dollars for 1974 would be just $20,000.).

3. INTERNAL HEALTH R & D ACTIVITIES - Research and development activities carried out by foundation personnel. It does not include the activity of consultants or others involved with monitoring, assisting or administering grant activities.

4. RESTRICTED GRANTS - Any grant which specifies a particular use for the grant money (e.g., building funds, research grants, scholarships, etc.) It does not include grants for operating expenses or for the general use of the recipient organization.

5. RECIPIENTS - The organization receiving the grant. There are eight categories of recipients.

   A. INTERNAL - (see above).

   B. MEDICAL SCHOOLS - including wholly owned hospitals.

   C. OTHER ACADEMIC INSTITUTIONS - colleges and universities and associated research institutes; professional schools except for medical schools. Includes two year colleges.

   D. PRIVATE NON-PROFIT ORGANIZATIONS - includes individuals; hospitals, not wholly owned by medical schools; voluntary agencies and non-profit foundations.

   E. STATE AND LOCAL GOVERNMENT AGENCIES - excludes higher education.

   F. FOREIGN - foreign citizens, organizations, or governments, and international organizations performing work abroad.

   G. INDUSTRIAL FIRMS - Organizations that may legally distribute profit to individuals or to other organizations.

   H. FEDERAL AGENCIES - Research projects directly administered by the Federal government or one of its agencies.

realization that we must sample both those foundations that may support health R & D and those which apparently do not. In this way we may contrast foundations which we know as a result of the mail survey definitely support health R & D with those foundations which definitely do not.

We have given precedence to the need to accurately estimate the level of foundation support for health R & D in designing the sampling and stratification plan for the survey. Only foundations which definitely supported health R & D in 1974 or were "in doubt" were sampled. It may be noted that the adoption of this stratagem does not rule out comparisons between foundations which support health R & D and those which do not, for some of the "in doubt" foundations turned out (as would be expected) not to support health R & D. We should remember, however, that this sample of foundations which do not support health R & D is a "biased" one — biased by the fact that they made grants in the field of health or in allied fields which conceivably could have been for health R & D activities.

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definitely made no grants for health R & D, there is no need to sample the foundation for its contribution to the level of support for health R & D of the universe of foundations is $0. Foundations which definitely support health R & D must be sampled because: (1) they may have made some grants which are "in doubt", and, in any case, (2) we want to be able to describe foundations which do support health R & D (e.g., factors influencing level of support, type of foundation, foundation fields of interest, etc.).

4.2.1 STRATIFICATION PLAN

4.2.1.2 THE NEED FOR STRATIFICATION

On the basis of the review of available grant data it is apparent that accurate estimation of the level of foundation support for health R & D requires stratified sampling of the population of foundations. Specifically, the review of available grant data disclosed that:

- Although 92% of the grant dollars identified as being for the purposes of health R & D come from foundations which made over $500,000 in grants in 1974, 69% of the over $111 million of "in doubt" grants were made by foundations which made under $500,000 in grants in 1974; further, 21% of the "in doubt" grants were made by foundations which made under $75,000 in grants in 1974.

- Although 89% of the grant dollars identified as being for the purposes of health R & D come from foundations identified by the computer search procedures as probably supporting health R & D, 72% of the "in doubt" grant dollars come from foundations not so identified, and over 58% of the "in doubt" grant dollars came from foundations not identified as probably supporting health R & D which made under $500,000 in grants in 1974.

In order to accurately estimate health R & D dollars we must stratify to ensure that both large and small foundations, both founda-

tions identified by computer search as probably supporting health R & D and those which were not so identified, and both foundations which definitely made grants for health R & D activities and foundations which are in doubt are selected.*

4.2.1.2 STRATIFICATION CELLS

The stratification plan utilized in the review of available grant data was expanded for the purposes of the mail survey by subdividing each of the seven stratification cells into foundations which definitely support health R & D (i.e. foundations which made grants which were identified as definitely being for the purposes of health R & D) and those which are "in doubt" as to their support of health R & D.** Thus, fourteen stratification cells are created (which henceforth we refer to as "samples"); these fourteen cells are described in Table VII.

4.2.1.3 SAMPLE ALLOCATION

It was decided to expand the size of the sample in the mail survey from 100 — as contractually specified — to 200, in order to more accurately estimate the level of foundation support for health R & D. The sample of 200 foundations was optionally allocated to the

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*A random sampling of the population would probably result in 80% of the sampled foundations being foundations which made under $75,000 in grants in 1974 (Stratum IV). This stratum accounts for only 7% of the grant dollars definitely identified as being for the purposes of health R & D and for only 21% of the "in doubt" grant dollars.

**Foundations which definitely made no health R & D grants in 1974 were not sampled.

TABLE VII

STRATIFICATION CELLS FOR MAIL SURVEY

Sample #	Stratum	Identified by Searches	Supports Health R & D
1	I	-	Yes
2	I	-	In Doubt
3	II	Yes	Yes
4	II	Yes	In Doubt
5	II	No	Yes
6	II	No	In Doubt
7	III	Yes	Yes
8	III	Yes	In Doubt
9	III	No	Yes
10	III	No	In Doubt
11	IV	Yes	Yes
12	IV	Yes	In Doubt
13	IV	No	Yes
14	IV	No	In Doubt

fourteen samples according to the Neyman Optional Allocation Formula.* The allocation was based on the following estimates derived from the review of available grant data:

- Estimates of the number of foundations which fall in each of the stratification cells (i.e. stratification cell populations). These estimates are presented in Table VIII.

- Estimates of the variance of possible grant dollars devoted to health R & D in each of the stratification cells, derived from estimates of grants definitely devoted to health R & D in the case of foundations which definitely support health R & D and from the estimates of "in doubt" grants for foundations whose support of health R & D is in doubt.

The sample allocation calculations are shown in Table IX. A short word about this optional allocation is in order. The optimal allocation employed in the present instance was designed only to decrease the variance of health R & D grant dollars in each of the stratification cells. However, optimal allocation based on one variable (e.g., estimated health R & D grant dollars) may not be an optimal allocation in terms of other variables (e.g., stability of funding for health R & D, factors influencing funding of health R & D, etc.).

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*Sukhatme, Pandurang V. and Sukhatme, Balkrishna V., Sampling Theory of Surveys with Applications, Ames, Iowa: Iowa State University Press, 1970, pp. 118-126.

TABLE VIII

ESTIMATED NUMBER OF FOUNDATIONS IN

EACH OF THE STRATIFICATION CELLS*

	Foundations identified by searches		Foundations not identified by searches		
Stratum	1	2	3	4	5
I	36	4	-	-	40
II	98	47	29	109	283
III	72	121	250	691	1,134
IV	232	513	920	8,050	9,715
Total	438	685	1,199	8,850	11,172*

Legend:

1 Foundations which support health R & D

2 Foundations in doubt

3 Foundations which support health R & D

4 Foundations in doubt

5 Total

*An estimated 15,740 foundations definitely do not support health R & D; thirteen of these foundations are from Stratum I, 205 from Stratum II, 1,040 from Stratum III, and 14,482 from Stratum IV.

TABLE IX

SAMPLE ALLOCATION CALCULATIONS

Stratum	Supports Health R&D	Identified by searches	Estimated stratification cell population (N_i)	ALLOCATION OF 200 TO ALL STRATA: $P_i = \frac{N_i}{N}$	S_i (000)	P_iS_i	$\frac{P_iS_i}{\Sigma P_iS_i}$	n_i where n=200	REALLOCATION OF 26 FROM STRATUM I TO REMAINING STRATA*: P_j	S_j (000)	P_jS_j	$\frac{P_jS_j}{\Sigma P_jS_j}$	Δn_j where n = 26	Final sample sizes
I	Yes		36	.003	2205.4	6.62	.268	54						36
	In doubt		4	.0004	3831.4	1.53	.062	12						4
II	Yes	Yes	98	.009	263.7	2.37	.096	19	.009	263.7	2.37	.140	4	23
	In doubt	Yes	47	.004	99.9	.40	.016	3	.004	99.9	.40	.020	1	4
	Yes	No	29	.003	73.1	.22	.009	2	.003	73.1	.22	.013	1	3
	In doubt	No	109	.010	158.0	1.58	.064	13	.010	158.0	1.58	.096	2	15
III	Yes	Yes	72	.006	40.7	.24	.010	2	.006	40.7	.24	.014	1	3
	In doubt	Yes	121	.011	74.7	.82	.033	7	.011	74.7	.82	.050	1	8
	Yes	No	250	.022	39.0	.86	.035	7	.022	39.0	.86	.052	1	8
	In doubt	No	691	.062	93.9	5.82	.236	47	.062	93.9	5.82	.352	6	53
IV	Yes	Yes	232	.021	22.2	.47	.019	4	.021	22.2	.47	.028	0	4
	In doubt	Yes	513	.046	11.0	.51	.021	4	.046	11.0	.51	.031	1	5
	Yes	No	920	.082	.2	.02	.0008	0	.083	.2	.02	.001	3	3
	In doubt	No	8,050	.721	4.5	3.24	.131	26	.723	4.5	3.24	.196	5	31
		N = 11,172				24.7	1.000	200			16.54	1.000	26	200

$$n_i = n \frac{P_iS_i}{\sum_{i=1}^{k} P_iS_i}$$

Where: n_i = sample size in stratification cell

n = total sample for all stratification cells

$P_i = \frac{N_i}{N} = \frac{\text{stratification cell population}}{\text{total population}}$

S_i = stratification cell variance

*Although the Neyman Optional Allocation calls for 66 foundations to be sampled from Stratum I, there are only 40 foundations from Stratum I which definitely support health R & D or are "in doubt". We reallocated the 26 "extra" foundations to the other stratification cells, resulting in a minimum sample size of three for each stratification cell.

4.3 SURVEY EXECUTION

4.3.1 SPECIFIC SAMPLING PROCEDURES

The 714 foundations studied in the review of available grant data were sorted into the fourteen stratification cells and into an additional category of foundations which made no health R & D grants in 1974 and would not be sampled. The foundations to be sampled, as determined by the optimal allocation formulae (see Table IX) were randomly selected from each of the fourteen strata. For Sample #10 there was not a sufficient number of foundations among the foundations originally studied from which to draw the sample. The grants lists of an additional fifty foundations in Stratum III not identified by searches were reviewed in order to identify foundations which were "in doubt." Foundations which were "in doubt" among these fifty foundations were added to the pool from which Sample #10 was drawn.

We again reviewed the grants list for 1974 of each of the foundations selected to be in the mail survey and compiled a list, foundation by foundation, of the grants which could possibly be for health R & D. If the number of such grants for a particular foundation was 20 or less, all of these grants were typed on Part II of the survey for review by the foundation; if the number of grants exceeded 20, a random sample of 20 of these grants was selected for review.

This second grants review resulted in an upward revision of our initial estimates of grant dollars which could possibly be for health R & D of foundations to be sampled in the mail survey of foundations.

If these new estimates are used as the basis for predicting foundation grant dollars which could possibly be for health R & D in the entire universe, we arrive at an estimate of $206.7 million. Approximately $172 million of this total is accounted for by grants which are "in doubt." The major cause of the discrepancy in estimated foundation grant dollars which could possibly be for health R & D between the first and second grants list review is the fact that in the second review we included grants which have a much lower probability of being for health R&D in the "in doubt" category. For example, grants to academic institutions whose purpose or field of interest was not detailed were included in the "in doubt" category in the second review (but not in the first). Some of the discrepancy is due to sampling differences. The universe estimate of health R & D derived from the first review of available grant data is based on a sample of 409 foundations which made grants which are definitely for health R & D or are "in doubt." The universe estimate derived from the second grants review is based on a sub-set of 200 of these foundations.

4.3.2 MAILING OF THE SURVEYS

The surveys, enclosed in Government franked envelopes, were addressed to the president or chief executive officer of the foundations. Occasionally we could not locate a mailing address for the foundation per se; in these cases the survey was addressed to the trustee or administrator whose address was listed as the mailing address of the foundation. The following additional materials were mailed along with the survey instrument: (1) a cover letter describing the purpose of the survey and urging participation, signed by the Deputy

Director of N.I.H. and (2) a Government franked envelope addressed to COOPER AND COMPANY for return of the survey.

Prior to the actual mailing of the surveys a small article describing the survey of foundation support for health R & D was published in both The Philanthropy Monthly and The Foundation News. It was hoped that this news release would be read by foundation executives and would increase the response rate to the survey.

4.3.3 FOLLOW-UP PROCEDURES

Approximately three weeks after the surveys had been mailed we mailed to the foundations which had not as yet responded to the survey a second copy of the survey instrument and materials sent along with the survey, with the following message stamped on the cover letter accompanying the survey: "TWO WEEKS AGO WE MAILED A COPY OF THIS SURVEY TO YOU. WE HAVEN'T RECEIVED YOUR RESPONSE YET. YOUR ANSWERS ARE VERY IMPORTANT TO NIH'S RESEARCH. WON'T YOU PLEASE TAKE A FEW MINUTES TO COMPLETE THE QUESTIONNAIRE, IF YOU HAVEN'T ALREADY DONE SO? BERNARD N. SAMERS, COOPER AND COMPANY, TEL. 203/325-1575."

We attempted to contact by telephone all foundations which had not mailed in surveys by the beginning of the third week following the second survey mailing. The purpose of the contacts was twofold: (1) to urge completion of the entire survey, and (2) to collect data which would allow us to correct for non-response bias. Specifically, we attempted to get representatives of the foundations to state whether the grants included in Part II of the survey were for health R & D,

and to compare the magnitude of health R & D grants the foundation made in 1972 and 1976 to those made in 1974. We were unable to obtain telephone numbers for three of the foundations which had not responded. Mail-O-Grams were sent to these foundations, urging response to the survey.

4.3.4 EDITING AND CODING OF SURVEYS

Each of the completed surveys was thoroughly reviewed for inconsistencies in responses between answers to survey questions and for errors in recording answers to various questions. If we were unable to clear up on our own the inconcistencies or correct the errors in the recording of responses, we contacted the particular foundations by telephone in order to ask them about their responses to the survey questions. Foundations were also contacted if their estimate of foundation grant dollars devoted to health R & D for the year 1974 differed significantly from our initial estimate of foundation support for health R & D based upon available grant data or from the foundation's analysis of grants made in 1974 which were listed in Part II of the survey.

For each foundation in the sample we prepared coding sheets in which we recorded not only the foundation's responses to the survey questions but also the following additional information: (1) foundation I.D. number, (2) foundation stratum, (3) sample number, (4) location of foundation (i.e. State), (5) type of foundation, (i.e. private, operating, company-sponsored or community), (6) total foundation grants in 1974, (7) our estimate of the dollar amount of health R & D grants made by the foundation in 1974 (i.e. grants which could possibly be

for health R & D) (8) our estimate of health R & D grants as a percent of total foundation grants in 1974, (9) age of foundation, (10) whether the foundation is in the D.R.A. "pool", (11) whether the grant activities of the foundation are followed by D.R.A., and (12) the dollar amount of foundation health R & D grants broken down by grant focus and type of grant recipient.* This last item was computed on the basis of foundation responses to Part II of the survey.

The information on the coding sheets was keypunched with 100% verification and the data cards were re-checked for keypunching errors.

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*Since there are three major focuses (biomedical, delivery, and other health R & D) and eight types of grant recipients (academic institutions, medical schools, foreign, internal, industrial, local and State government, Federal Government, and private non-profit organizations) there are a total of 24 (8 X 3) possible combinations of focus-type of recipient. We recorded foundation grant dollars in 1974 for each of these combinations.

5 ESTIMATION OF FOUNDATION SUPPORT FOR HEALTH R & D IN 1974

The estimation of the level of foundation support for health R & D in 1974 was a multi-stage process involving: (1) accumulation for each stratification cell of health R & D grant dollars based upon completed surveys or upon foundation answers to telephone inquiries about their support for health R & D in 1974, (2) correction of these stratification cell totals for non-response bias by estimating support of health R & D by foundations which did not respond to the survey or to our telephone inquiries, and (3) weighting of the corrected stratification cell totals by the estimated number of foundations in each of the stratification cells in order to arrive at a universe estimate.

The present section opens with a discussion of these three stages. The description of the estimation methodology is followed by the presentation of our estimate, based upon the mail survey, of the level of support for health R & D and the statistical confidence limits for this estimate. We then compare the estimate based upon the mail survey to the DRA estimate of foundation support for health R & D and to our initial estimate based upon the review of available grant data. Finally, we analyze the mail survey estimate in terms of grant focus and type of grant recipient.

5.1 ESTIMATION METHODOLOGY

5.1.1 ACCUMULATION BY STRATIFICATION CELL OF HEALTH R & D GRANT DOLLARS

For each stratification cell we accumulated the foundation health R & D grant dollars in 1974 for foundations which either mailed in a completed survey or responded to our telephone inquiry. For foundations which mailed in a completed survey, the estimate of health R & D grant dollars was based upon foundation responses to: (1) Question #3 of Part I, which reads, "Please estimate the total grant dollars paid out during 1974 which were specifically restricted for the purpose of HEALTH R & D activities. $_____," and (2), Part II of the survey which requested that foundations state whether specific grants they made during 1974 were for the purposes of health R & D, and the focus and type of recipient of these grants. If the foundation grants contained in Part II were only a sample of the foundation grants in 1974 which could possibly be for health R & D, an estimate of the total foundation grants was calculated by dividing the dollar amount of the sample of the grants in Part II which the foundation stated were for health R & D by the total dollar amount of all grants included in Part II and then multiplying this figure by the dollar amount of all grants which the foundation made in 1974 which could possibly be for health R & D (i.e. the summation of the dollar amounts of grants identified as definitely being for the purpose of health R & D plus the foundation's "maximum exposure"). Any contradictions between estimates of foundation support of health R & D based upon re-

sponses to Question #3 and Part II were clarified.

For foundations which did not mail in a completed survey, but which we contacted by telephone, estimates of foundation support of health R & D were generally based solely upon review of the foundation grants contained in Part II of the survey. Most foundations contacted by telephone found it extremely difficult to estimate foundation grant dollars paid out in 1974 for health R & D activities without first reviewing Part II of the survey.

5.1.2 CORRECTION FOR NON-RESPONSE BIAS

5.1.2.1 RESPONSE RATE TO THE MAIL SURVEY

We recorded the date on which we received the completed mail survey and/or the date(s) on which the foundation was contacted by telephone. A total of 76 foundations (36% of the sample) completed and mailed in the survey by the time of the second survey mailing. An additional 47 foundations (23.5% of the sample) mailed in the completed survey by the time we started to contact foundations by telephone. We obtained estimates of health R & D grant dollars of 53 (26.5% of the sample) based upon our telephone contacts with foundations; 17 foundations we contacted by telephone subsequently mailed in completed surveys. Twenty-four foundations (12% of the sample) did not mail in completed surveys nor respond to our telephone inquiries. The response rate, broken down by sample, is presented in Table X.

Another way of evaluating the extent of non-response is to estimate the percentage of health R & D grant dollars that is accounted

TABLE X

RESPONSE RATE TO SURVEY

Sample #	1	2	3	4	5
1	52.78	16.67	22.22	8.33	36
2	0.00	25.00	0.00	75.00	4
3	65.22	21.74	8.70	4.35	23
4	50.00	0.00	50.00	0.00	4
5	33.33	33.33	33.33	0.00	3
6	26.67	40.00	26.67	6.67	15
7	0.00	0.00	66.67	33.33	3
8	0.00	37.50	50.00	12.50	8
9	25.00	50.00	25.00	0.00	8
10	39.62	20.76	32.08	7.55	53
11	25.00	25.00	0.00	50.00	4
12	0.00	40.00	60.00	0.00	5
13	33.33	0.00	33.33	33.33	3
14	32.26	22.58	22.58	22.58	31
TOTALS	38.00%	23.50%	26.50%	12.00%	200

Legend:

1 Percent of foundations in sample responding to first mailing

2 Percent of foundations in sample responding to second mailing

3 Percent of foundations in sample who responded as a result of telephone contact

4 Percent of foundations in sample who were non-respondents

5 Total number of foundations in sample

for by foundations which mailed in completed surveys, by foundations which answered our telephone inquiries, and by foundations which did not mail in completed surveys nor respond to our telephone calls. In order to estimate these percentages we weighted each of the foundations in the sample by a weighting factor based on estimates derived from the first review of available grant data and tabulated for each type of response the (weighted) number of foundations which fell in that particular classification. The weighting factor was equal to the total estimated health R & D grant dollars in the "review cell" from which the foundation was drawn, divided by the estimated health R & D grant dollars in the universe and multiplied by the inverse of the sample size drawn from that particular "review cell", viz:

$$\frac{\text{Total estimated health R \& D \$ in "review cell"}}{\text{Total estimated health R \& D \$ in universe}} \times \frac{1}{\text{Sample size of "review cell"}}$$

By "review cell" we mean each of the seven cells from which samples were drawn for the first review of available grant data. The estimate of health R & D grant dollars in a particular cell is equal to all the grant dollars in the cell which were definitely identified as being for the purposes of health R & D plus 20%* of the "in doubt" grant dollars.

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*Prior to the mail survey we had estimated that 20% of the "in doubt" grant dollars identified in the first review of grant data are actually for health R & D activities. The results of the mail survey indicate that the 20% estimate was fairly accurate; slightly over 21% of the "in doubt" grant dollars identified in the first review of available grant data actually turned out to be for health R & D activities.

Our analysis indicates that approximately 42.0% of the estimated health R & D grant dollars is accounted for by foundations which responded to the first mailing of the survey, 21.8% by foundations which responded to the second mailing, 24.4% by foundations which answered our telephone inquiries, and 11.8% by foundations which neither mailed in completed surveys nor responded to our telephone calls.

5.1.2.2 TREATMENT OF NON-RESPONDENTS

Although there was a relatively high response rate to the survey — as measured by either the unweighted or weighted (by estimated health R & D grant dollars) number of foundations responding to the mailings or to the telephone inquiries — we nevertheless felt it important to minimize non-response bias. This was accomplished by estimating for each of the non-respondents the foundation grant dollars in 1974 which were expended for the purpose of health R & D. These estimates were added to the estimates of health R & D which we had previously accumulated, by stratification cell, for foundations which responded to the survey.

The individual estimates of health R & D grant dollars in 1974 of foundations which did not respond to the survey were based upon a thorough re-examination of their grants lists. In the case of 25% of the non-respondents the particular grants lists were sufficiently detailed to allow us to estimate, without reliance on any additional information, the foundations' health R & D grant dollars. For the other non-respondents, health R & D grant dollar estimates were arrived at by assuming that these foundations would be most similar in their sup-

port of health R & D to foundations which responded as a result of our telephone inquiries. For each of the 14 samples we therefore computed the percentage of foundations which supported health R & D of those foundations which responded as a result of our telephone calls. A non-respondent foundation was deemed to support health R & D if a majority of the foundations which responded as a result of our telephone inquiries in that particular sample* supported health R & D. If this were the case, all of the non-respondent foundation's grants which could possibly be for health R & D were classified as health R & D grants with the exception of types of grants which the mail survey showed were rarely, if ever, for health R & D (e.g. grants to disease foundations, such as the American Heart Association; grants to academic institutions where the field of interests of the grant was not specified, etc.).

5.1.3 WEIGHTING OF STRATIFICATION CELL TOTALS

Since we did not sample every foundation in the stratification cells (with the exception of Sample #1), the foundation health R & D grant dollars that we accumulated for each of the cells were weighted by the number of foundations in the particular cell in order to arrive at estimates of health R & D grant dollars for all foundations in the

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*If the number of foundations which responded as a result of our telephone calls in a particular sample was very small (i.e. one or two foundations), we also examined the percentage of foundations in a particular stratum which we recontacted by telephone and which supported health R & D.

cell. The estimate of health R & D grant dollars for the universe as a whole is merely the summation of these weighted cell estimates. The weighting factor for a given stratification cell is equal to the estimated number of foundations in that particular cell divided by the number of foundations in that cell which were sampled.*

5.2 LEVEL OF FOUNDATION SUPPORT FOR HEALTH R & D IN 1974

The COOPER AND COMPANY estimate of foundation support for health R & D, based upon analysis of the mail survey, is presented in Table XI. We estimate that in 1974, foundations made a total of $78.89 million in grants for the purposes of health R&D. Over $31 million of this total (39.50%) is accounted for by foundations in Stratum I; over $22.6 million (28.72%) by foundations in Stratum II. Thus over 68.2% of the health R & D grant dollars in 1974 is accounted for by strata which contain only 2% of the estimated number of foundations in the universe. In fact, an examination of Table XII reveals that a total of only 194 foundations (0.7% of the estimated number of foundations in the universe) account for this 68.2% figure. In general as foundation size (measured by annual grants or value of assets) decreases, the likelihood of a foundation supporting health R & D radically decreases; whereas 56.6% of Stratum I and 33.6% of Stratum II foundations support health R & D, only 5.25% of Stratum IV foundations support health R & D.

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*The weighting factor is actually the universe of the sampling fraction.

TABLE XI

COOPER AND COMPANY ESTIMATE OF FOUNDATION SUPPORT

FOR HEALTH R & D IN 1974 BASED ON FOUNDATION MAIL SURVEY

Stratification Cell Number	Sample Description: Stratum	1	2	3	4	5	6	7
1	I	-	Yes	31,164.0	39.50	83.33	1,038.8	1,927.0
2	I	-	In doubt	0.0	0.00	0.00	-	-
3	II	Yes	Yes	17,582.6	22.27	91.30	196.5	359.9
4	II	Yes	In doubt	323.1	0.41	50.00	13.8	1.8
5	II	No	Yes	539.2	0.68	56.67	27.9	37.3
6	II	No	In doubt	4,213.4	5.34	33.33	116.0	147.5
7	III	Yes	Yes	3,435.2	4.35	100.00	47.7	31.5
8	III	Yes	In doubt	2,888.9	3.66	50.00	47.8	68.3
9	III	No	Yes	1,312.5	1.66	37.50	14.0	9.6
10	III	No	In doubt	12,092.0	15.33	13.21	132.5	327.1
11	IV	Yes	Yes	3,741.0	4.74	100.00	16.1	18.4
12	IV	Yes	In doubt	0.0	0.00	0.00	-	-
13	IV	No	Yes	0.0	0.00	0.00	-	-
14	IV	No	In doubt	1,602.2	2.03	12.90	1.5	2.1
Totals				78,894.1	99.97	42.50	439.1	1,234.6

Legend:

1 Was foundation identified by searches?
2 Does available data suggest that foundation supports health R & D?
3 Health R & D grant dollars in cell (in thousands of dollars)
4 Percent of total health R & D grant dollars
5 Percent of foundations in cell which had health R & D grants
6 Mean grant dollars of foundation in cell which had health R & D grants (in thousands of dollars)
7 Standard deviation of mean (in thousands of dollars)

TABLE XII

ESTIMATED NUMBER OF FOUNDATIONS

SUPPORTING HEALTH R & D IN 1974

Stratum	1	2	3
I	53	30	56.60
II	488	164	33.61
III	2,181	319	14.62
IV	24,278	1,275	5.25
Totals	27,000	1,788	6.22

Legend

1 Estimated number of foundations in stratum

2 Estimated number of foundations which had health R & D grants

3 Percent of foundations which had health R & D grants

Based on the first review of available grant data we estimated that approximately $54.8 million of foundation grants were definitely for health R & D with another $111.3 million in grants "in doubt". Our second review of available grant data for foundations to be included in the mail survey disclosed that the "in doubt" estimate for the universe should be raised upward to $151.9 million. If our initial estimate of foundation grants dollars which were definitely for health R & D is accurate — which we think it is* — then approximately $24.1 "in doubt" grants turned out to be for health R & D.

5.2.1 CONFIDENCE LIMITS FOR ESTIMATE OF LEVEL OF SUPPORT FOR HEALTH R & D**

The confidence limit estimate for health R & D grant dollars is complex because of four factors in the sampling scheme:

1. It is a stratified sample.
2. The secondary strata or stratification cell sizes are unknown and are estimated from a preliminary sample.
3. The estimate is for the sum of the dollars given by all

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*For the foundations which were included in the mail survey, the vast majority of foundation grants which we had identified as being for health R & D based on available grant data, were classified by the foundations themselves as being for health R & D. A few grants which we had thought were for health R & D actually were for other purposes. However, the dollar amount of these grants was counterbalanced by grants which were not listed or described in available grants lists (and hence we had not categorized them as being definitely for health R & D, "in doubt", etc.), but which the foundations stated were for health R & D activities.

**The formulae presented in this section are based on: (1) Sukhatme, P.V. and Sukhatme, B.V., Sampling Theory of Surveys with Applications, Ames, Iowa: Iowa State University Press, 1970, Sections 3.2, 3.10 and 7.2, and (2) Des Raj, Sampling Theory, New York: McGraw Hill, 1968, Sections 4.2 and 6.3.

foundations; not the mean of all foundations.

4. For a few foundations all of the grants were not evaluated, but a subset of the grants was sampled.

Item 1. above is handled by a standard computation of the variance for stratified sampling. Item 2. involves a special development of this model for "double sampling" which involves additional error terms for estimating the size of the secondary strata. Item 3. involves multiplying the variance of the estimate by N^2 or the standard error by N. Item 4. necessitates adding an additional term for the within-foundation variance when grants were sampled.

The development of this model is detailed below.

Let $\bar{y}_n$ = the estimated value of total health R & D grants per foundation derived from the sample of n foundations; i.e., the estimated population mean.

P_i = the number of foundations in the i-th stratum (N_i) ÷ the total number of foundations (N)

S_i = the standard deviation of the foundations in the i-th stratum

n_i = the number of foundations sampled from the i-th stratum

f_i = the sampling fraction in the i-th stratum, i.e., n_i/N_i.

M = the number of primary strata

k_i = the number of secondary strata within the i-th primary stratum

Then, for the case of simple stratified sampling the variance model is:

$$V_{(\bar{y}_n)} = \sum_{i=1}^{M} (1 - f_i) P_i^2 \frac{S_i^2}{n_i}$$

Note: P_i^2 is the square of the weight factor for the i-th stratum, and $(1-f_i)$ is the finite population correction factor for that stratum.

When the secondary stratum sizes and, therefore, the weights, are unknown and are estimated from a preliminary sample, the variance model is:

$$V_{(\bar{y}_n)_D} = \sum_{i=1}^{M} \sum_{j=1}^{k_i} (1-f_{ij}) P_{ij}^2 \frac{S_{ij}^2}{n_{ij}}$$

$$+ \sum_{i=1}^{M} \left[\frac{(\sum_{j=1}^{k_i} N_{ij}) - Q_i}{(\sum_{j=1}^{k_i} N_{ij}) - 1} \cdot \frac{1}{Q_i} \left\{ \sum_{j=1}^{k_i} (1-f_{ij}) P_{ij} (1-P_{ij}) \frac{S_{ij}^2}{n_{ij}} \right.\right.$$

$$\left.\left. + \sum_{j=1}^{k_i} P_{ij} (\bar{y}_{N_{ij}} - \bar{y}_{N_i})^2 \right\} \right]$$

where: $\bar{y}_{N_i}$ = the mean value for the i-th (primary) stratum

$\bar{y}_{N_{ij}}$ = the mean value for the j-th secondary stratum of the i-th primary stratum

P_{ij} = the number of foundations in the j-th secondary stratum of the i-th primary stratum (N_{ij}) divided by N

S_{ij} = the standard deviation of the foundations in the j-th secondary stratum of the i-th primary stratum

n_{ij} = the number of foundations sampled from the j-th secondary stratum of the i-th primary stratum

f_{ij} = the sampling fraction in the j-th secondary stratum of the i-th primary stratum, i.e., n_{ij}/N_{ij}

Q_i = the size of the preliminary sample from the i-th stratum

Note: the first term is the simple stratified sampling term, and the third (last) term is a function of the variation between the secondary strata of each primary stratum.

To derive the variance for the estimate of the population total, we note the following:

Let $\hat{Y}_n$ = the estimate of total health R & D dollars for all foundations

Then, $\hat{Y}_n = N\bar{y}_n$

and $V_{(\hat{Y}_n)} = N^2 V_{(\bar{y}_n)}$

Thus, to estimate the variance of the total as opposed to the mean we multiply the variance of the mean by N^2, or alternatively, the standard error of the total is N times the standard error of the mean. Since $P_{ij}^2 = (N_{ij}^2/N^2)$, the N^2 cancel in most of the terms.

Finally, another error term must be included in the variance calculation because nineteen foundations were not asked to provide detailed information on all their grants, but their grants were sampled.

Let X_{r_t} = the value of the t-th grant in the r-th foundation

$\overline{X}_r$ = the mean value of the grants sampled from the r-th foundation

M_r = the number of grants in the r-th foundation

m_r = the number of grants sampled in the r-th foundation

f_r = the sampling fraction within the r-th foundation, i.e., m_r/M_r

$\hat{Y}_r$ = the estimate of the total value of health R & D grants in the r-th foundation

r_{ij} = the number of grants sampled from the r-th foundation in the j-th secondary foundation of the i-th primary foundation

Then: $$\hat{Y}_r = \frac{1}{f_r} \sum_{t=1}^{r_{ij}} X_{r_t}$$

and $$\text{Var } \hat{Y}_r = (1-f_r) \frac{M_r^2}{m_r} \sum_{t=1}^{r_{ij}} \frac{(X_{r_t} - \overline{X}_r)^2}{m_r - 1}$$

The contribution to the total variance due to subsampling the grants is then:

$$V(\hat{Y}_{n_r}) = \sum_{i=1}^{M} \sum_{j=1}^{k_i} \frac{1}{f_{ij}} \sum_{r=1}^{n_{ij}} \text{Var } \hat{Y}_r$$

The confidence interval for the total is given by

$$\hat{Y}_N \leq \hat{Y}_n \pm t_{(\alpha,\gamma)}\, S_{(\hat{Y}_n)}$$

Where: $S_{(\hat{Y}_n)}$ = the square root of the estimated variance of $\hat{Y}_n$

$t_{(\alpha,\gamma)}$ = the student's t value for the $(1-\alpha)$ probability, with γ degrees of freedom.

Now, γ is estimated by

$$\gamma = \frac{1}{\sum_{i=1}^{M} \sum_{j=1}^{k_i} \frac{L_{ij}^2}{V_{ij}}}$$

where $V_{ij} = n_{ij} - 1$

L_{ij} = proportion of the total variance, $V_{(\hat{Y}_n)}$, contributed by the j-th secondary stratum of the i-th primary stratum.

As γ was calculated to be approximately equal to 84, the student's t distribution is closely approximated by the standard normal distribution. Half-widths of confidence intervals for three values of α are given below.

HALF-WIDTH OF CONFIDENCE INTERVALS $t_{(\alpha,\gamma)}\, S_{(\hat{Y}_n)}$, FOR FOR THREE VALUES OF α (IN MILLIONS OF DOLLARS)

α	.50	.64	.90
Half-width of confidence interval	13.3	19.7	32.4

Thus, there is a 50% probability that the actual total foundation health R & D grant dollars for the year 1974 is between $65.6 million and $92.2 million, and a 90% probability that the actual foundation health R & D grant dollars for the year 1974 is between $46.5 million and $111.3 million. Since the 200 foundations that were sampled spent over $37.3 million on health R & D, there is good reason to believe that universe expenditures on health R & D are well above the lower limits of the confidence intervals. The reason that the confidence interval is relatively broad is that the estimates for the variance for the health R & D grant dollars for stratification cells 10 and 14 — on the basis of which we calculated the optimal sample allocation — were too low (i.e. we significantly underestimated the variance of the health R & D grant dollars of these two stratification cells). Although we allocated relatively large samples to stratification cells 10 and 14, the sample size for these two cells should have been larger.

5.3 COMPARISON OF MAIL SURVEY ESTIMATE OF LEVEL OF SUPPORT FOR HEALTH R & D WITH D.R.A. ESTIMATE

D.R.A. estimated that in 1974 private non-profit foundations gave $53.8 million in grants for health R & D. The mail survey of foundations (corrected for non-response bias) found that this figure was closer to $78.9 million. The DRA bases its estimate of health R & D on the grant activities of twenty-four foundations; eleven of these foundations were included in the mail survey of foundations.*

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*The D.R.A. pool has ten Stratum I foundations, nine of which were included in the mail survey. The pool also has eleven Stratum II foundations, two of which were included in the mail survey.

The D.R.A. estimated that these foundations gave $41.0 million in grants for health R & D; based upon the results of the mail survey we estimate that these foundations gave only $26.2 million in grants for health R & D. Apparently, the D.R.A. has underestimated total foundation support for health R & D in 1974 not because of underestimation of the health R & D grant dollars of individual foundations in the pool, but because the "historical multiplier" which is used to inflate the pool health R & D dollar total to arrive at a universe estimate is too low.

The same pattern of results is revealed if we analyze the grant activities of the foundations which D.R.A. follows (or "tracks"). Nineteen* of the thirty-seven foundations whose grant activities D.R.A. follows were included in the mail survey. D.R.A. estimated that these nineteen foundations gave $45.4 million in grants for health R & D in 1974. Based upon the mail survey we estimate that these foundations actually gave $30.8 million in grants for health R & D.

5.4 COMPARISON OF MAIL SURVEY ESTIMATE OF LEVEL OF SUPPORT FOR HEALTH R & D WITH ESTIMATE BASED UPON REVIEW OF AVAILABLE GRANT DATA

On the basis of the second review of available grant data we had estimated that the foundations in the sample gave $61.4 million in health R & D grants in 1974. Analysis of the mail survey results shows

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*The D.R.A. follows the grant activities of sixteen Stratum I foundations, fifteen of which were included in the mail survey. D.R.A. also tracks sixteen Stratum II foundations, three of which were included in the mail survey.

that the 200 foundations in the sample actually gave $37.3 million. If we weight each of the foundations in the sample by the number of foundations in the particular stratification cell from which the foundation was drawn, we may estimate health R & D grant dollars for the entire universe. When we base this estimate on the second review of grant data we arrive at an estimate of $206.7 million for foundation support of health R & D; based on analysis of the mail survey we estimate that foundations only gave $78.9 million for health R & D activities.

Table XIII presents these estimates, stratification cell by stratification cell, along with two ways of comparing these two sets of estimates. For each stratification cell we computed the ratio of the foundation health R & D grant dollars based on the mail survey divided by our estimate of health R & D grant dollars based on the second review of available grant data. For the sample population as a whole, this ratio is 0.61, meaning that estimated health R & D grant dollars based on the mail survey was only 0.61 of estimated health R & D grant dollars based on the second review of available grant data. The ratios range from 0.00 to 1.00 with an average ratio of 0.40. Additionally for each stratification cell we computed the health R & D dollar overestimate for the sample and for the population of the cell as a whole, assuming that the mail survey estimate is the correct figure.

5.5 BREAKDOWN OF HEALTH R & D GRANT DOLLARS BY FOCUS OF GRANT AND TYPE OF RECIPIENT

In Part II of the mail survey, foundations were asked to categorize each of the health R & D grants that they made in terms of focus

TABLE XIII

COMPARISON OF MAIL SURVEY AND AVAILABLE DATA REVIEW ESTIMATES OF HEALTH R & D

Stratification Cell Number	1	2	3	4	5	6	7	8
1	36	35,418.6	31,164.0	0.88	4,254.6	35,418.6	31,164.0	4,254.6
2	4	12,355.0	0.0	0.00	12,355.0	12,355.0	0.0	12,355.0
3	23	6,345.9	4,126.4	0.65	2,219.5	27,037.7	17,582.6	9,455.2
4	4	711.7	27.5	0.04	684.2	8,362.5	323.1	8,039.4
5	3	76.5	55.8	0.73	20.7	739.6	539.2	200.3
6	15	2,614.0	579.8	0.22	2,034.2	18,995.8	4,214.4	14,782.4
7	3	163.9	143.1	0.87	20.8	3,934.4	3,435.2	499.2
8	8	631.1	191.0	0.30	440.1	9,544.7	2,888.9	6,655.8
9	8	89.9	42.0	0.47	47.9	2,809.1	1,312.5	1,496.6
10	53	2,680.2	927.4	0.35	1,752.7	35,024.4	12,092.0	22,932.4
11	4	64.5	64.5	1.00	0.0	3,741.0	3,741.0	0.0
12	5	30.6	0.0	0.00	30.6	3,142.1	0.0	3,142.1
13	3	1.7	0.0	0.00	1.7	513.7	0.0	513.7
14	31	173.7	6.2	0.04	167.6	45,117.3	1,602.2	43,515.1
Totals	200	61,357.3	37,327.7	0.61	24,029.6	206,735.9	78,894.1	127,841.8

Legend:

1 Number of foundations in sample
2 Estimated health R & D dollars of foundations in sample based on second review of available data (in thousands of dollars)
3 Estimated health R & D dollars of foundations in sample based on mail survey (in thousands of dollars)
4 Ratio of Column 3 to Column 2
5 Health R & D dollar overestimate of sample (Column 2 minus Column 3) (in thousands of dollars)
6 Estimated health R & D dollars of foundations in universe based on second review of available data (in thousands of dollars)
7 Estimated health R & D dollars of foundations in universe based on mail survey (in thousands of dollars
8 Health R & D dollars overestimate for universe (Column 6 minus Column 7) (in thousands of dollars)

of grant (i.e. biomedical, delivery or other health R & D) and type of grant recipient (e.g. academic instruction, medical schools, etc.). On the basis of a foundations's responses we computed the foundation's health R & D grant dollars for each of the 24 grant focus-type of recipient combinations.* In order to estimate the percentage of total (universe) health R & D dollars which are accounted for by each of the focus-recipient combinations, we weighted the foundation grant dollar figures for each of the combinations by the number of foundations in the stratification cell from which the foundation was drawn, and then summed over all foundations. These estimated are presented in Table XIV.

Almost two-thirds (63.0 %) of health R & D grant dollars were for biomedical R & D, 19.8% for "other" R & D, and 17.2% for delivery R & D. Over one-half (53.71%) of health R & D grant dollars in 1974 went to either academic institutions or to medical schools, 38.4% to other (domestic) private non-profit organizations, 6.48% to foreign recipients, and 1.41% to all other recipients. The combinations of academic institutions — biomedical R & D, medical schools — biomedical R & D and other private non-profit organizations — biomedical R & D, account for over 58% of the total foundation health R & D grant dollars.

Table XV presents for each stratum the percentage of stratum

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*Three focus categories times eight type of recipient categories equals 24 focus-recipient combinations.

TABLE XIV

BREAKDOWN OF TOTAL HEALTH R & D GRANT DOLLARS

BY GRANT FOCUS AND TYPE OF RECIPIENT*

	Focus			
Type of Recipient	Biomedical	Delivery	Other	Total
Academic institution	14.66	5.49	3.26	23.41
Medical school	18.05	4.30	7.95	30.30
(Academic and Medical)	(32.71)	(9.79)	(11.21)	(53.71)
Other private non-profit organizations	25.69	6.60	6.10	38.39
Foreign	3.88	0.51	2.09	6.48
Intramural	0.73	0.00	0.00	0.73
State and Local Government	0.00	0.26	0.09	0.35
Federal Government	0.00	0.00	0.33	0.33
Industrial	0.00	0.00	0.00	0.00
Total	63.01	17.16	19.82	99.99

*Figures in cells indicate percentage of total estimated health R & D grant dollars which were for particular grant recipient-grant focus combination.

TABLE XV

BREAKDOWN OF STRATUM HEALTH R & D GRANT DOLLARS BY

GRANT FOCUS AND TYPE OF RECIPIENT*

Type of Recipient	Focus			
	Biomedical	Delivery	Other	Totals
STRATUM I				
Academic Institution	19.68	10.00	2.77	32.45
Medical School	16.72	5.37	0.00	22.09
(Academic & Medical)	(36.40)	(15.37)	(2.77)	(54.54)
Other Private non-Profit Organizations	17.69	9.63	6.07	33.39
Other recipients	6.86	1.54	3.68	12.08
TOTALS FOR STRATUM I	60.95	26.54	12.52	100.01
STRATUM II				
Academic Institution	9.02	1.45	5.85	16.32
Medical School	21.65	4.99	23.26	49.90
(Academic & Medical)	(30.67)	(6.44)	(29.11)	(66.22)
Other Private non-Profit Organizations	20.07	5.49	2.52	28.08
Other recipients	3.65	0.00	2.06	5.71
TOTALS FOR STRATUM II	54.39	11.93	33.69	100.01
STRATUM III				
Academic Institution	0.00	0.00	0.00	0.00
Medical School	27.69	0.00	5.51	33.20
(Academic & Medical)	(27.69)	(0.00)	(5.51)	(33.20)
Other Private non-Profit Organizations	63.93	0.00	2.86	66.79
Other recipients	0.00	0.00	0.00	0.00
TOTALS FOR STRATUM III	91.62	0.00	8.37	99.99
STRATUM IV				
Academic Institution	22.82	0.00	0.00	22.82
Medical School	1.02	0.00	0.00	1.02
(Academic & Medical)	(23.84)	(0.00)	(0.00)	(23.84)
Other Private non-Profit Organizations	52.15	0.00	24.01	76.16
Other recipients	0.00	0.00	0.00	0.00
TOTALS FOR STRATUM IV	75.99	0.00	24.01	100.00

*Figures in cells indicate percentage of estimated stratum health R & D grant dollars which were for particular grant recipient-grant focus combination.

foundation health R & D grant dollars accounted for by each of the focus-recipient combinations. Biomedical R & D accounts for the lion's share of health R & D dollars, ranging from 91.6% of Stratum III health R & D grant dollars, to 54.39% of Stratum II grant dollars. Except for Stratum I, "Other" health R & D accounts for a greater share of foundation health R & D grant dollars than delivery R & D. In Strata I and II, academic institutions and medical schools account for over one-half of the strata grant dollars; in Strata III and IV, other private non-profit institutions account for over one-half of strata grant dollars. In all four strata the three previously mentioned combinations of academic institutions-biomedical R & D, medical schools-biomedical R & D, and other private non-profit institutions-biomedical R & D account for the majority of health R & D dollars, ranging from 50.74% in Stratum II to 91.62% in Stratum III.

Only 0.3% of the foundations in the universe are estimated to have intramural health R & D. These foundations account for 0.73% of total foundation health R & D grant dollars.

6 DESCRIPTION OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

We present in this section a description of foundations which support health R & D based upon foundation responses to the mail survey questions and on publically available information on these selfsame foundations which were included in the mail survey.* Although our emphasis in Section 6 is on describing those foundations which do support health R & D, we shall simultaneously describe those which do not. Without such a comparison group one cannot tell whether a given factor or variable characteristic of foundations which support health R & D is peculiar to them, or is also characteristic of the population (i.e. universe of foundations) as a whole. It should be remembered, however, that this comparison group of foundations which does not support health R & D is biased by the fact that they were selected for inclusion in the mail survey based upon the fact that a review of available data about these foundations does not permit us to ascertain whether they do or do not support health R & D.

The sample of foundations upon which these universe descriptions are based varies from factor to factor and depends upon the response rates to the various survey questions and on the publically available information on the foundations surveyed. Each of the tables in this section and in Section 7 indicates the number of foundations in the sample upon which the given descriptions or characterizations are based. Appendix D presents confidence limits for observed values of a dichotomous or multinomial variable expressed as a percent, given

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*Additional descriptive material on foundations which support health R & D is found in Sections 5 and 7.

particular sample sizes; based upon these confidence limits the significance of various parameter values can be assessed.

6.1 WEIGHTING SYSTEMS FOR DATA

In order to be able to characterize and describe the universe of private non-profit foundations as a whole, and, in particular, the foundations which support health R & D, we weighted each of the individual "observations" about foundations in the mail survey sample by: (1) the number of foundations in the stratification cell from which the particular foundation was drawn and (2) the estimated foundation health R & D grant dollars of that stratification cell.* To weight each of the individual observations by the number of foundations in its stratification cell, we simply multiplied each of the observations by a weighting factor equal to the inverse of the sampling fraction for that stratification cell. The sampling fraction is equal to the number of foundations in a particular stratification cell sampled divided by the total number of foundations in that stratification cell. The totals for each of the individual stratification cells were cumulated in order to provide estimates for the entire universe of foundations.

The weighting by health R & D grant dollars was accomplished by multiplying each observation about a foundation by a weighting factor equal to the percentage of 1974 foundation health R & D grant dollars accounted for by the stratification cell from which the foundation was drawn.

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*See Section 5, Table XI.

The first weighting system — weighting by number of foundations in each stratification cell — allows us to ascertain whether and to what extent a given foundation response or characteristic is typical of all foundations in the universe — not only of the foundations sampled. The second weighting system — weighting by stratification cell foundation health R & D grant dollars — allows us to determine what percentage of foundation health R & D grant dollars are associated with foundations with given characteristics or responses.

6.2 BACKGROUND INFORMATION ON FOUNDATIONS: TYPE OF FOUNDATION, AGE OF FOUNDATION, AND LOCATION

Analysis of Table XVI reveals that although "other private non-profit foundations" account for over 95% of all foundations in the universe (based upon information collected about foundations included in the mail survey)*, they account for a considerably lower percentage of total foundation health R & D grant dollars (82.7%); only 15.8% of "other private non-profit foundations" in the total population (universe) are estimated to support health R & D activities. Community foundations, which mail survey data indicate are only 0.1% of all foundations in the universe, account for 8.9% of total foundation health R & D grant dollars; in fact, all six community foundations included in the mail survey had health R & D grants. Company sponsored

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*According to Foundation Center estimates, 5% of the total private non-profit foundation universe consists of operating foundations; community foundations account for perhaps 0.7% of private non-profit foundations; the rest of the foundations are either company-sponsored or other private non-profit foundations. The Foundation Directory, which has information on over 2,500 foundations, lists only 273 company-sponsored foundations. (The Foundation Center, Facts on Foundations).

TABLE XVI

SUPPORT OF HEALTH R & D BY TYPE OF FOUNDATION

Type of Foundation	n in sample	1	2	3	4	5
Company-sponsored	26	2.3	33.2	4.8	1.8	5.4
Community	6	0.1	100.0	0.9	0.0	8.9
Operating	3	2.4	1.9	0.3	2.8	3.0
Other Private non-Profit	165	95.2	15.8	94.0	95.4	82.7
Totals	200	100.0	16.0	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total number of foundations in universe

2 Percent of types of foundations in universe which support health R & D

3 Type of foundation as percent of total number of foundations which support health R & D

4 Type of foundation as percent of total number of foundations which do not support health R & D

5 Type of foundation as percent of total health R & D grant dollars

foundations also account for a greater proportion of health R & D grant dollars (5.4%) than is warranted based upon the estimated number of such foundations in the universe (mail survey data indicate that they comprise only 2.3% of all foundations in the universe); over 33.2% of company-sponsored foundations in the universe are estimated to support health R & D activities.

Over three out of every four foundations which support health R & D are less than 21 years old; however, foundations in this age bracket account for less than 20% of foundation health R & D grant dollars. Despite the fact that over one-half of health R & D grant dollars are accounted for by foundations between 21 and 40 years old, these foundations represent only 17.3% of the total foundations in the universe which support health R & D. Additionally, the likelihood of a foundation in this age bracket — 21 to 40 years old — supporting health R & D is only 10.5% (versus a high of 27.1% for foundations aged 41-50 years old). (See Table XVII).

Support of health R & D also appears to be strongly associated with foundation location. Nearly 59% of the foundations which support health R & D are located in New York State, accounting for over 31% of foundation health R & D grant dollars.* The Midwest has over 11% of the foundations which support health R & D, accounting for over 27% of total foundation health R & D grant dollars. None of the sixteen foundations in the mail survey who are located in southern states had

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*It is estimated that over 20% of the nation's foundations are located in New York State. See footnote to Table XVIII.

TABLE XVII

SUPPORT OF HEALTH R & D BY AGE OF FOUNDATION

Age of Foundation	n in sample	1	2	3	4	5
10 years or less	31	25.6	25.1	39.0	23.0	6.6
11-20 years	52	38.2	16.0	37.0	38.4	13.1
21-30 years	63	28.7	7.9	13.7	31.7	32.1
31-40 years	23	3.6	16.5	3.6	3.6	19.7
41-50 years	25	3.9	27.3	6.5	3.4	27.0
51 years or more	1	0.0	100.0	0.2	0.0	1.5
Totals	195	100.0	16.0	100.0	100.1	100.0

Legend:

1 Age bracket as percent of total number of foundations in universe

2 Percent of foundations of given age bracket in universe which support health R & D

3 Foundations in age bracket as percent of total number of foundations which support health R & D

4 Foundations in age bracket as percent of total number of foundations which do not support health R & D

5 Foundations in age bracket as percent of total health R & D grant dollars

any health R & D grants. We conclude that southern foundations account for little, if any, of the nation's foundation health R & D grant dollars. (See Table XVIII).

6.3 WRITTEN FOUNDATION STATEMENT OF PROGRAM POLICY AND SUPPORT OF HEALTH R & D

We queried foundations who were included in the mail survey as to whether they had a written statement of program policy (Part I, Q. 1). Based upon their responses we estimate that 12.6% of the total number of foundations in the universe have written statements of program policy; when we focus only on foundations which support health R & D this figure rises to 20.1%. Foundations which have written statements of program policy account for over one-half (54.0%) of total foundation health R & D grant dollars and are more likely to support health R & D than foundations without a written program policy. (See Table XIX).

6.4 FOUNDATION COMMITMENT TO HEALTH R & D

Foundations which were surveyed were asked whether they are specifically committed to supporting health R & D activities (Part II, Q. 2), and if so, the basis for this commitment (Part II, Q. 2a). Three answer categories were supplied for this latter question: (1) policy, (2) specific restriction of funds as a result of endowment, etc., and (3) other. Foundations which are committed to health R & D are estimated to comprise 13.8% of all foundations in the population of foundations which support health R & D; foundations which are committed to health R & D account for 41.4% of the total foundation health

TABLE XVIII

SUPPORT OF HEALTH R & D BY LOCATION OF FOUNDATION

Location of Foundation (Region of U.S.A.)*	n in sample	1	2	3	4	5
New England	22	10.4	13.8	9.0	10.6	7.9
New York	57	22.5	41.5	58.5	15.7	31.1
Atlantic Central	28	15.1	3.4	3.3	17.4	16.6
South	16	27.2	0.0	0.0	32.3	0.0
Midwest	45	13.1	11.2	9.2	13.9	27.4
West	18	10.8	26.0	17.5	9.5	7.5
Southwest	14	9.0	46.0	2.6	0.6	9.5
Totals:	200	100.0	16.0	100.1	100.0	100.0

Legend:

1 Foundations in region as percent of total number of foundations in universe**

2 Percent of foundations in region which support health R & D

3 Foundations in region as percent of total number of foundations which support health R & D

4 Foundations in region as percent of total number of foundations which do not support health R & D

5 Foundations in region as percent of total health R & D grant dollars

*New England = Maine, Massachusetts, Rhode Island, Vermont, New Hampshire and Connecticut; Atlantic Central = New Jersey, Pennsylvania, Delaware, District of Columbia, Maryland, West Virginia; South = Virginia, North Carolina, South Carolina, Georgia, Florida, Louisiana, Alabama, Mississippi, Arkansas, Tennessee, Kentucky; Midwest = North Dakota, South Dakota, Iowa, Nebraska, Kansas, Illinois, Indiana, Michigan, Minnesota, Wisconsin, Missouri, Ohio; West = Washington, Oregon, California, Hawaii, Colorado, Wyoming, Nevada, Utah, Montana, Idaho, Alaska; Southwest = Texas, Oklahoma, Arizona, New Mexico.

**This estimate is based upon data collected about the 200 foundations in the mail survey. The Foundation Center (Facts on Foundations) found that in 1974 10.3% of foundations were located in New England, 20.4% in New York, 12.1% in Atlantic Central states, 12.2% in the South, 26.4% in the Midwest, 12.3% in the West, and 6.2% in the Southwest. Thus the sample of 200 foundations, if weighted by the number of foundations in each of the stratification cells, over-represents foundations located in the South, and under-represents foundations located in the Midwest.

TABLE XIX

WRITTEN FOUNDATION STATEMENT OF PROGRAM POLICY AND SUPPORT OF HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations with written Program Policy	43	12.6	28.0	20.1	11.0	54.0
Foundations without Written Program Policy	79	87.4	16.1	80.0	89.0	86.0
	112	100.0	16.0*	100.1	100.0	100.0

Legend:

1 Type of foundation as percent of total number of foundations in universe

2 Percent of foundations of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Type of foundation as percent of total foundation health R & D grant dollars

*Estimate based on total sample, not only on foundations responding to this question.

R & D grant dollars. Surprisingly, an estimated 86.2% of all foundations which support health R & D do not view themselves as "committed" to providing this support; these foundations account for 58.6% of total foundation health R & D grant dollars (see Table XX).

Of the foundations which view themselves as committed to health R & D, in 48.% of the cases this commitment is the result of foundation policy, in 6.6% of the cases it is the result of restricted foundation funds, and in 45.4% of the cases the commitment is a result of "other" reasons. Nearly 80% of the health R & D grant dollars of foundations which are committed to health R & D are accounted for by foundations which are committed as a result of foundation policy (See Table XXI).

6.5 FACTORS INFLUENCING LEVEL OF FOUNDATION FUNDING FOR HEALTH R & D, AS IDENTIFIED BY SAMPLED FOUNDATIONS

Foundations were requested to identify up to three factors (and order them in terms of importance) which influence the level of foundation support for health R & D in a given year (Part I, Q. 7). These factors were to be chosen from a list of ten factors which included: (1) amount of gifts or contributions received, (2) return on investment in prior years, (3) change in [foundation] interest to or from health R & D, (4) foundation goals or objectives, (5) I.R.S. minimum distribution requirements, (6) level of Government support for health R & D, (7) current public issues, (8) number or quality of competitive requests for funding received, (9) recent developments in the field of health, and (10) others. A total of 100 foundations in

TABLE XX

SUPPORT OF HEALTH R & D BY COMMITMENT TO HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations Committed to Health R & D	23	2.9	100.0	13.8	0.00	41.4
Foundations not Committed to health R & D	107	97.1	18.7	86.2	100.00	58.6
Totals:	130	100.0	16.0*	100.0	100.00	100.0

Legend:

1 Type of foundation as percent of foundations in universe.

2 Percent of foundations of given type in universe which support health R & D.

3 Type of foundation as percent of foundations in universe which support health R & D.

4 Type of foundation as percent of foundations in universe which do not support health R & D

5 Type of foundation as percent of total foundation health R & D grant dollars

*Estimate based on total sample, not only on foundations responding to this question.

TABLE XXI

REASON FOR FOUNDATION COMMITMENT TO HEALTH R & D

Reason for Foundation Commitment to health R & D	n in sample	1	2	3
Foundation policy	17	48.0	79.6	32.7
Restricted funds	3	6.6	13.6	5.6
Other	2	45.4	6.8	2.8
Totals:	22	100.0	100.0	41.4

Legend:

1 As percent of foundations in universe which are committed to health R & D

2 As percent of health R & D grant dollars of foundations committed to health R & D

3 As percent of total foundation health R & D grant dollars

the sample specified at least one factor, 89 specified at least two factors, and 74 specified three factors. Of the 100 foundations who responded to the question, 62 support health R & D and 38 do not. Based upon the responses of the foundations which were sampled, we estimated the percentage of foundations in the universe whose level of health R & D funding is influenced by each of the factors, and calculated the percentage of total foundation health R & D dollars associated with foundations who are influenced by each of the factors. These are presented in Table XXII. Panel I of Table XXII shows the percentage of foundations influenced by each factor — cumulated over all three factors (in order of importance) which the foundations were requested to list. Panel II displays these percentages only for factors which the foundations would identify as most important; Panel III shows these percentages for factors that would be identified as second most important; and Panel IV only for factors that would be identified as third most important.

Of the foundations which support health R & D, we estimate that 68.1% are influenced by "changes in (foundation) interest to or from health R & D", 57.3% by "current public issues" and 54.8% by "recent developments in the field of health." However, if we weight foundation responses by health R & D dollars, a different pattern of foundation influence emerges. Over 71.4% of health R & D dollars are accounted for by foundations which are influenced by "foundation goals and objectives", 69.3% by "number or quality of competitive requests received" and 45.4% by "recent developments in the field of health." Only 8.3% of foundations which support health R & D are estimated to

TABLE XXII

FACTORS INFLUENCING LEVEL OF FUNDING FOR HEALTH R & D AS IDENTIFIED BY FOUNDATIONS THEMSELVES

PANEL I: FACTORS INFLUENCING LEVEL OF FUNDING FOR HEALTH R & D, WHETHER IDENTIFIED AS MOST IMPORTANT, SECOND MOST IMPORTANT, OR THIRD MOST IMPORTANT

Factor Number	n in sample	1	2	3	4	5
1	16	20.9	17.1	17.8	21.7	14.7
2	17	23.3	16.5	18.8	24.4	17.6
3	24	28.3	40.5	68.1	20.2	33.4
4	66	45.8	15.2	35.4	48.0	71.4
5	13	22.4	6.9	8.3	25.3	13.6
6	12	11.2	9.2	0.3	12.8	4.1
7	23	30.1	34.0	57.3	24.1	24.2
8	61	61.7	10.7	34.2	68.7	69.3
9	30	34.6	33.2	54.8	29.5	45.4
10	5	21.8	4.7	4.7	22.5	7.0

Legend:

1 Percent of foundations in universe influenced by factor
2 Percent of foundations in universe influenced by factor which support health R & D
3 Percent of foundations which support health R & D influenced by factor
4 Percent of foundations which do not support health R & D influenced by factor
5 Percent of total foundation health R & D dollars accounted for by foundations influenced by factor

Factor 1: Amount of gifts or contributions received
2: Return on investment in prior years
3: Change in interest to or from health R & D
4: Foundation goals and objectives
5: I.R.S. minimum distribution requirements
6: Level of government support for health R & D
7: Current public issues
8: Number or quality of competitive requests for funding received
9: Recent developments in field of health
10: Other

TABLE XXII (continued)

PANEL II: MOST IMPORTANT INFLUENCE ON LEVEL OF FUNDING

Factor Number	n in sample	1	2	3	4	5
1	9	11.5	26.5	15.4	10.5	6.7
2	4	1.0	58.3	3.1	0.5	2.9
3	12	9.5	14.9	7.2	10.0	13.3
4	41	29.6	11.5	17.4	32.6	46.7
5	2	3.1	6.4	1.0	3.6	1.0
6	1	0.2	0.0	0.0	0.3	0.0
7	2	7.4	0.4	0.1	9.1	1.9
8	20	21.7	12.3	13.6	23.7	17.1
9	6	8.0	95.4	38.7	0.5	7.6
10	3	8.0	8.4	3.4	9.2	2.9
Totals	100	100.0	16.0*	99.9	100.0	100.1

Legend:

1 Percent of foundations in universe which would identify factor as most important influence

2 Percent of foundations in universe, which would identify factor as most important influence, which support health R & D

3 Percent of foundations which support health R & D which would identify factor as most important influence

4 Percent of foundations which do not support health R & D which would identify factor as most important influence

5 Percent of total foundation health R & D dollars accounted for by foundations which would identify factor as most important influence

Factor 1: Amount of gifts or contributions received
2: Return on investment in prior years
3: Change in interest to or from health R & D
4: Foundation goals and objectives
5: I.R.S. minimum distribution requirements
6: Level of government support for health R & D
7: Current public issues
8: Number or quality of competitive requests for funding received
9: Recent developments in field of health
10: Other

*Estimate based on total sample, not only on foundations responding to question

TABLE XXII (continued)

PANEL III: SECOND MOST IMPORTANT INFLUENCE ON LEVEL OF FUNDING

Factor number	n in sample	1	2	3	4	5
1	2	8.5	0.0	0.0	10.7	0.0
2	9	21.2	14.5	14.9	22.8	12.2
3	4	8.7	6.1	2.6	10.2	5.1
4	17	4.8	68.4	16.2	1.9	18.4
5	5	1.2	33.3	1.9	1.0	5.1
6	6	10.0	0.6	0.3	12.5	4.1
7	7	10.8	84.4	44.3	2.1	1.0
8	25	28.4	7.9	11.0	32.9	34.7
9	12	6.2	24.8	7.5	5.9	15.3
10	2	0.3	100.0	1.3	0.0	4.1
Totals	89	100.1	16.0*	100.0	100.0	100.0

Legend:

1 Percent of foundations in universe which would identify factor as second most important influence

2 Percent of foundations in universe, which would identify factor as second most important influence , which support health R & D

3 Percent of foundations which support health R & D which would identify factor as second most important influence

4 Percent of foundations which do not support health R & D which would identify factor as second most important influence

5 Percent of total foundation health R & D dollars accounted for by foundations which would identify factor as second most important influence

Factor 1: Amount of gifts or contributions received
2: Return on investment in prior years
3: Change in interest to or from health R & D
4: Foundation goals and objectives
5: I.R.S. minimum distribution requirements
6: Level of government support for health R & D
7: Current public issues
8: Number or quality of competitive requests for funding received
9: Recent developments in field of health
10: Other

*Estimate based on total sample, not only on foundations responding to question

TABLE XXII (continued)

PANEL IV: THIRD MOST IMPORTANT INFLUENCE ON LEVEL OF FUNDING

Factor number	n in sample	1	2	3	4	5
1	5	0.9	50.0	2.4	0.5	7.5
2	4	1.1	12.5	0.8	1.1	2.5
3	8	10.1	100.0	58.3	0.0	15.0
4	8	11.4	2.6	1.8	13.5	6.3
5	6	18.1	5.1	5.4	20.7	7.5
6	5	1.0	100.0	6.0	0.0	0.0
7	14	11.9	10.3	7.1	12.9	21.3
8	16	11.6	16.6	9.6	12.1	17.5
9	12	20.4	7.3	8.6	22.8	22.5
10	0	13.5	0.0	0.0	16.3	0.0
Totals	78	100.0	16.0*	100.0	99.9	100.1

Legend:

1 Percent of foundations in universe which would identify factor as third most important influence

2 Percent of foundations in universe, which would identify factor as third most important influence, which support health R & D

3 Percent of foundations which support health R & D which would identify factor as third most important influence

4 Percent of foundations which do not support health R & D which would identify factor as third most important influence

5 Percent of total foundation health R & D dollars accounted for by foundations which would identify factor as third most important influence

Factor 1: Amount of gifts or contributions received
2: Return on investment in prior years
3: Change in interest to or from health R & D
4: Foundation goals and objectives
5: I.R.S. minimum distribution requirements
6: Level of government support for health R & D
7: Current public issues
8: Number or quality of competitive requests for funding received
9: Recent developments in field of health
10: Other

*Estimate based on total sample, not only on foundations responding to question

be influenced by "I.R.S. minimum distribution requirements"; only 13.6% of the foundation health R & D grant dollars are accounted for by foundations which are influenced by this factor. Foundations which do not support health R & D, on the other hand, are influenced more by "number or quality of competitive requests for funding received" (68.7% of foundations not supporting health R & D), "foundation goals and objectives" (48.0%) and, perhaps surprisingly, by "recent developments in the field of health" (29.2%). (Table XXII, Panel I).

If we examine the most important influence on level of funding for health R & D activities by foundations which support health R & D (i.e. had health R & D grants in 1974), it is estimated that "recent developments in field of health" is the most important influence for 38.7% of the foundations which support health R & D "foundation goals and objectives" is the most important influence for 17.4%, and "amount of gifts or contributions received" the most important influence for 15.4%. The "I.R.S. minimum distribution requirements" are the most important influence for only 1.0% of the foundations which support health R & D .* A different pattern of influence emerges when we weight foundation responses by health R & D grant dollars: 46.7% of health R & D grant dollars are accounted for by foundations for whom the most important influence is "foundation goals and objectives", 17.1% of health R & D grant dollars by foundations for whom the most important influence is "number or quality of competitive requests

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*The foundations for which this factor is the most important influence account for only 1.9% of foundation health R & D grant dollars.

for funding received", and 13.3% by foundations for whom the most important influence is "changes in (foundation) interest to or from health R & D." For foundations which do not support health R & D, the "most important" influences on their level of funding for health R & D are: "foundation goals and objectives" (the most important influence for 32.6% of foundations not supporting health R & D), "number or quality of competitive requests for funding received" (23.7%), and "amount of gifts or contributions received" (10.5%).

6.6 ACTIVE FOUNDATION GRANT AREAS

Foundations which were included in the mail survey were asked to identify up to three general areas in which the foundation is "actively granting support or sponsoring internal* projects", and list them in terms of "order of magnitude of dollar support" (Part I, Q. 8). A total of 118 foundations listed at least one active grant area, 114 listed at least two active grant areas, and 103 listed three active grant areas. Sixty-three foundations which responded to this question support health R & D and fifty-five do not. Table XXIII shows the percentage of foundations which consider a particular area of interest as an active foundation grant area, and the percentage of health R & D grant dollars associated with foundations for whom each general support area is an active foundation grant area.

Because of the criteria for inclusion in the mail survey, we feel that universe estimates of the distribution of foundation active

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*I.e., intramural

TABLE XXIII

ACTIVE FOUNDATION GRANT AREAS

PANEL I: ACTIVE FOUNDATION GRANT AREAS, WHETHER GRANT AREA IS FIRST, SECOND OR THIRD IN ORDER OF MAGNITUDE OF FOUNDATION DOLLAR SUPPORT

Active grant area	n in sample	1	2	3	4	5
Welfare	49	53.9	16.7	61.5	53.0	33.5
Religion	28	51.8	2.2	8.2	59.7	14.9
Health R & D	31	26.8	44.4	34.5	17.4	38.9
Health Other than R & D	51	23.4	14.9	23.0	23.5	57.2
Humanities	45	41.8	9.5	26.1	44.2	30.4
Sciences	7	1.0	65.9	4.6	0.4	7.6
Educational programs	96	77.6	17.3	84.3	75.8	84.3
Other	25	23.9	7.7	11.5	25.8	33.3

Legend:

1 Percent of foundations in universe for which area is active grant area*
2 Percent of foundations in universe for which area is active grant area supporting health R & D
3 Percent of foundations supporting health R & D for which area is active grant area
4 Percent of foundations not supporting health R & D for which area is active grant area
5 Percent of total foundation health R & D grant dollars accounted for by foundations for which area is active grant area

*Based on mail survey sample. See text for discussion of reliability of this estimate.

TABLE XXIII (continued)

PANEL II: MOST IMPORTANT ACTIVE GRANT AREA IN TERMS OF MAGNITUDE OF FOUNDATION SUPPORT

Active grant area	n in sample	1	2	3	4	5
Welfare	19	27.1	1.5	2.4	31.9	13.6
Religion	7	14.8	0.0	0.0	17.7	0.0
Health R & D	10	3.0	94.6	17.6	0.2	14.3
Health Other than R & D	13	10.9	9.5	6.3	11.8	10.4
Humanities	10	3.2	40.7	7.8	2.2	3.4
Sciences	3	0.4	13.3	0.3	0.4	4.1
Educational programs	45	39.3	24.1	57.7	35.6	39.5
Other	8	1.5	85.9	7.9	0.2	14.7
Totals	115	100.2	16.0**	100.0	100.0	100.0

Legend

1 Percent of foundations in universe for which area is most important active grant area*
2 Percent of foundations in universe for which area is most important active grant area supporting health R & D
3 Percent of foundations which support health R & D for which area is most important active grant area
4 Percent of foundations not supporting health R & D for which area is most important active grant area
5 Percent of total foundation health R & D grant dollars accounted for by foundations for which area is most important active grant area

*Based on mail survey sample. See text for discussion of reliability of this estimate.

**Estimate based on total sample, not only on foundations responding to question.

TABLE XXIII (continued)

PANEL III: SECOND MOST IMPORTANT ACTIVE GRANT AREA

Active grant area	n in sample	1	2	3	4	5
Welfare	9	7.6	84.1	43.1	1.4	6.1
Religion	10	28.5	1.4	2.8	33.0	2.5
Health R & D	8	2.8	61.0	11.5	1.3	9.9
Health other than R & D	24	3.4	49.7	11.4	2.0	30.8
Humanities	23	24.0	7.0	11.3	26.2	12.6
Sciences	0	0.0	0.0	0.0	0.0	0.0
Educational programs	33	26.0	11.1	19.4	27.1	31.6
Other	7	7.6	1.0	0.5	8.9	6.5
Totals	114	99.9	16.0**	100.0	99.9	100.0

Legend:

1 Percent of foundations in universe for which area is second most important active grant area*
2 Percent of foundations in universe for which area is second most important active grant area supporting health R & D
3 Percent of foundations which support health R & D for which area is second most important active grant area
4 Percent of foundations which do not support health R & D for which area is second most important active grant area
5 Percent of total foundation health R & D grant dollars accounted for by foundations for which area is second most important grant area

*Based on mail survey sample. See text for discussion of reliability of this estimate

**Estimate based on total sample, not only on foundations responding to question

TABLE XXIII (continued)

PANEL IV: THIRD MOST IMPORTANT ACTIVE GRANT AREA

Active grant area	n in sample	1	2	3	4	5
Welfare	21	19.2	11.7	16.0	19.7	13.8
Religion	11	8.5	8.9	5.4	9.0	12.4
Health R & D	13	21.0	34.5	51.6	15.9	14.7
Health other than R&D	14	9.1	8.3	5.3	9.7	16.0
Humanities	12	14.6	6.8	7.0	15.8	14.4
Sciences	4	0.6	96.2	4.3	0.0	3.5
Educational programs	18	12.3	8.1	7.2	13.1	13.2
Other	10	14.8	3.0	3.1	16.7	12.1
Totals	103	100.1	16.0**	99.9	99.9	100.1

Legend

1 Percent of foundations in universe for which area is third most important active grant area*
2 Percent of foundations in universe for which area is third most important active grant area supporting health R & D
3 Percent of foundations which support health R & D for which area is third most important active grant area
4 Percent of foundations which do not support health R & D for which area is third most important active grant area
5 Percent of total foundation health R & D grant dollars accounted for by foundations for which area is third most important active grant area

*Based on mail survey sample. See text for discussion of reliability of this estimate.

**Estimate based on total sample, not only on foundations responding to question

areas based upon the mail survey data are inaccurate. We therefore refrain from further discussion of these estimates, except to note that even based upon our biased sample, only 3.0% of the foundations in the universe consider health R & D their most important active grant area (Table XXIII, Panel II). If we focus on foundations which support health R & D, over 84.3% of such foundations list "educational programs" as one of their active grant areas, with 57.7% listing it as their most important active grant area. In fact, among foundations which support"health R & D "educational programs" is listed as an active grant area — or, in fact, as the most important grant area — more often than health R & D" and "health other than R & D" combined (Table XXIII, Panels I and II). Foundations which list "educational programs" among their three most important active grant areas account for 84.3% of health R & D grant dollars, those which identify "educational programs" as their most important active grant area account for nearly 40% of health R & D grant dollars. Based on these figures it is not surprising that 96.9% of foundations which identify "educational programs" as their primary active support area list health R & D as their second or third most important active grant area.

6.7 THE GRANT PROPOSAL EVALUATION PROCESS AND SUPPORT OF HEALTH R & D

Three questions in the mail survey dealt with foundation evaluation of grants. Foundations were asked: (1) whether they accept (for consideration) grant proposals or requests for health R & D projects (Part I, Q. 10), (2) who evaluates potential foundation grants and

makes recommendations about them (Part I, Q. 11a) and (3) who makes the final decisions about foundation funding of specific grants (Part I, Q. 11b).

Although it is estimated that 73.1% of all foundations in the universe claim to accept health R & D grant proposals or requests, only 54.0% of the foundations which support health R & D claimed to do so. However, these foundations account for nearly 80% of foundation health R & D grant dollars (See Table XXIV).

Since many foundations are family foundations, it is not surprising that in nearly 60% of the foundations in the universe a single unpaid officer or a small family group evaluates grants or requests for funds. Among foundations which support health R & D, this percentage falls to 31%. In fact, grants are evaluated by outside consultants in approximately 37% of the foundations which support health R & D. If we weight foundation responses by health R & D grant dollars, a totally different pattern emerges. Over 87% of the health R & D grant dollars are accounted for by foundations in which grants are evaluated by the paid staff of the foundations (See Table XXV).

Final grant decisions are made out in nearly four out of five foundations which support health R & D by foundation board of directors or trustees; foundations in which final grant decisions are made by foundation board of directors or trustees account for 86.5% of total foundation health R & D grant dollars. Among foundations which do <u>not</u> support health R & D it is more likely that final grant decisions are made by a single unpaid officer or small family group

TABLE XXIV

ACCEPTANCE OF HEALTH R & D GRANT PROPOSALS AND SUPPORT OF HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations which accept health R & D grant proposals	95	73.1	10.7	54.0	76.0	79.2
Foundations which do not accept health R & D grant proposals	32	26.9	24.7	46.0	24.0	20.8
Totals	127	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total number of foundations in universe

2 Percent of given types of foundations in universe supporting health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXV

GRANT EVALUATION AND SUPPORT OF HEALTH R & D

Type of Personnel who Evaluate Grants	n in sample	1	2	3	4	5
Single Unpaid Officer	13	27.9	4.5	7.9	31.6	1.1
Small Family Group	27	31.8	11.3	22.7	33.4	9.5
Single Paid Executive	10	2.4	20.4	3.2	2.3	5.8
Paid Staff of Foundation	23	1.4	56.5	5.0	0.7	37.2
Outside Consultants	2	11.5	50.0	36.6	6.8	0.1
Outside Consultants and Paid Staff	13	0.8	57.1	2.8	0.4	19.5
Other*	33	24.3	14.2	21.8	24.7	26.9
Totals	121	100.1	16.0*	100.0	99.9	100.1

*Estimate based on total sample, not only on foundation responding to question

Legend:

1 Percent of total number of foundations in universe in which grants are evaluated by given type of personnel
2 Percent of foundations in universe where personnel of given type evaluate grants which support health R & D
3 Percent of foundations which support health R & D in which grants are evaluated by given type of personnel
4 Percent of foundations which do not support health R & D in which grants are evaluated by given type of personnel
5 Percent of total foundation health R & D grant dollars accounted for by foundations in which grants are evaluated by given type of personnel

*"Other" responses include board of directors or trustees, volunteer staff, and combinations of all of the above categories of personnel.

rather than by foundation board of directors or trustees. (See Table XXVI).

6.8 FOUNDATION BUDGET ALLOCATION PROCESS AND SUPPORT OF HEALTH R & D

Eleven questions in the survey dealt with the budget allocation process and foundation support for health R & D. Foundations were asked whether they draw up specific budget allocations for various areas of funding (Part I, Q. 9). Additionally, they were asked whether the following statements are true descriptions of how foundation budget allocations are drawn up:

(1) "A limit is set each year on total foundation giving based on available dollars before requests for funds are considered." (Part I, Q. 12a)

(2) "Total foundation giving is based on broad, predetermined foundation objectives and goals" (Part I, Q. 12b)

(3) "Requests for funds from recipient organizations are sometimes reduced by the foundation before allocations are made" (Part I, Q. 12c)

(4) "Requests for funds are ordered by priority and dollars are allocated in priority order until no more funds are available" (Part I, Q. 12d)

(5) "At periodic intervals all requests are considered and weighed against each other simultaneously" (Part I, Q. 12e)

TABLE XXVI

TYPE OF PERSONNEL RESPONSIBLE FOR FINAL DECISION ON GRANTS AND SUPPORT OF HEALTH R & D

Type of personnel responsible for final decision on grants	n in sample	1	2	3	4	5
Single unpaid officer	6	19.7	1.2	1.5	23.3	0.2
Small family group	25	29.4	10.7	18.9	31.5	9.6
Single paid executive	0	0.0	0.0	0.0	0.0	0.0
Committee(s) of full-time foundation employees	1	0.0	100.0	0.1	0.0	1.9
Outside consultants	0	0.0	0.0	0.0	0.0	0.0
Board of Directors or trustees of foundation	85	38.7	34.0	78.9	30.6	86.5
Other	7	12.3	0.7	0.6	14.6	1.7
Totals	124	100.1	16.0*	100.0	100.0	99.9

Legend:

1 Percent of total foundations in universe in which type of personnel are responsible for final grant decision
2 Percent of foundations in universe where type of personnel are responsible for final grant decisions which support health R & D
3 Percent of foundations which support health R & D where given type of personnel are responsible for final grant decision
4 Percent of foundations which do not support health R & D where given type of personnel are responsible for final grant decision
5 Percent of foundation health R & D grant dollars accounted for by foundations in which given type of personnel are responsible for final grant decision

*Estimate based on total sample, not only on foundations responding to question .

(6) "Sometimes available dollars are not allocated because enough acceptable requests which satisfy the foundation's goals are not forthcoming" (Part I, Q. 12f)

(7) "Each request is evaluated and decided upon independently of all other requests" (Part I, Q. 12g)

(8) "If there is an excess of worthy requests, some additional dollars are made available for allocation" (Part I, Q. 12h)

(9) "All foundation dollars are allocated at one point in time" (Part I, Q. 12i).

We defer discussion of the eleventh question asked about foundation budget allocations to the next section dealing with the tax laws concerning private non-profit foundations.

Foundations which support health R & D are about evenly split as to whether they have specific budget allocations for given funding areas; this pattern contrasts sharply with that of foundations which do not support health R $ D, for only 18.5% of foundations which do not support health R & D draw up specific budget allocations for given funding areas. Yet 73.2% of foundation health R & D grant dollars are accounted for by foundations which do not draw up such specific budget allocations. (See Table XXVII).

Three out of four foundations (75.7%) which support health R & D draw up a (predetermined) limit on available grant dollars before requests are considered; these foundations account for 66.3% of total foundation health R & D grant dollars. Foundations which have

TABLE XXVII

DRAWING UP OF SPECIFIC BUDGET ALLOCATIONS FOR GIVEN FUNDING AREAS AND FOUNDATION SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations which draw up specific budget allocations for given funding areas	30	23.0	32.1	47.3	18.5	26.8
Foundations which do not draw up specific budget allocations for given funding areas	92	77.0	10.7	52.7	81.5	73.2
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of given types of foundations in universe which support health R & D

3 Type of foundations as percent of foundations which support health R & D

4 Type of foundations as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

such a predetermined limit on allocations are twice as likely to support health R & D than those which do not draw up such a limit. (See Table XXVIII). Even though a preponderence of foundations which support health R & D draw up a limit on grant dollars before requests are considered, it is estimated that 71.3% of foundations which support health R & D also allocate additional monies if there is an excess of worthy grants; yet foundations which do allocate additional monies account for only 42.5% of foundation health R & D grant dollars. In fact, foundations which do not allocate additional monies are slightly more likely to support health R & D than those that do (18.3% of the former support health R & D versus 15.1% of the latter). (See Table XXIX).

The converse situation rarely befalls foundations which support health R & D. It is estimated that only 5.6% of foundations which support health R & D decide not to allocate available grant dollars because there are not enough acceptable requests. The foundations which in fact do not allocate available grant dollars because of a lack of acceptable requests tend to be larger foundations (in terms of annual grants), for fully 26.0% of health R & D grant dollars are accounted for by this 5.6% of foundations. Over 40% of foundations which do not support health R & D sometimes do not allocate available grant dollars because enough acceptable requests are not forthcoming. (See Table XXX).

Foundations were queried as to whether their "total giving" is based on broad foundation goals and objectives. Slightly over

TABLE XXVIII

PREDETERMINED LIMIT ON AVAILABLE GRANT DOLLARS AND SUPPORT OF HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations which have predetermined limit on available grant dollars	79	57.9	21.4	75.7	54.4	66.3
Foundations which do not have predetermined limit on available grant dollars	45	42.1	9.5	24.3	45.6	33.7
Totals:	124	100.0	16.0*	100.0	100.0	100.0

Legend

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXIX

ALLOCATION OF ADDITIONAL MONIES AND SUPPORT OF HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations which allocate additional monies if there is excess of worthy requests	60	75.0	15.1	71.3	75.7	42.5
Foundations which do not allocate additional monies if there is excess of worthy requests	62	25.0	18.3	28.7	24.3	57.5
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXX

NON-ALLOCATION OF AVAILABLE GRANT DOLLARS AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations where available grant dollars are not allocated because there are not enough acceptable requests	32	36.0	2.5	5.6	41.9	26.0
Foundations where all available grant dollars are allocated	90	64.0	24.0	94.4	58.1	74.0
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

half (53.6%) of the foundations which support health R & D responded in the affirmative; these foundations account for 87.6% of total foundation health R & D grant dollars. It may be noted that analysis of responses to a previously described question of what factors, in the foundation's estimation, influence the foundation's level of funding for health R & D, disclosed that 35.4% of foundations which support health R & D (accounting for 71.4% of health R & D grant dollars) are significantly influenced by "foundation goals and objectives." (See Table XXXI).

We asked foundations whether each request for funds is evaluated and decided upon independently of all other requests for funds (Q. 12g) or whether periodically grants are weighed against each other (Q. 12e). Over 87% of foundations which support health R & D decide upon each grant request independently of all other grant requests; these foundations account for 69.0% of all foundation health R & D grant dollars. Foundations which decide upon each grant request independently of all other requests are three times more likely to support health R & D than those that do not (See Table XXXII). The question of whether grant requests are simultaneously weighted against each other produced a different pattern of results than one would expect on the basis of foundation responses to the previous question. Over 63% of foundations which support health R & D periodically weigh each grant request against all other grant requests; foundations which do so account for 41% of total foundation grant R & D grant dollars (See Table XXXIII). This apparent contradiction may be explained if we assume that for most foundations which support

TABLE XXXI

BASING TOTAL GIVING ON BROAD FOUNDATION GOALS AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations in which total giving is based on broad foundation goals	92	42.7	20.6	53.6	40.6	87.6
Foundations in which total giving is not based on broad foundation goals	31	57.3	13.2	46.4	59.4	12.4
Totals	123	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXXII

INDEPENDENT DECISION ON GRANT REQUESTS AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations in which each grant request is decided upon independently of all other requests	89	69.6	20.6	87.4	66.1	69.0
Foundations in which each grant request is not decided upon independently of all other requests	34	30.4	6.8	12.6	33.9	31.0
Totals:	123	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXXIII

SIMULTANEOUSLY WEIGHING GRANT REQUESTS AGAINST EACH OTHER

AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations which periodically weigh grants against each other	53	59.6	17.4	63.6	58.8	41.0
Foundations which do not periodically weigh grants against each other	69	40.4	14.6	36.4	41.2	59.0
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

health R & D, at some point in the grant request evaluation process grants are weighed against each other, yet at the time when final decisions are made about grant requests, each grant is evaluated and decided upon independently.

Nearly nine out of ten (88.6%) foundations which support health R & D reduce requests for funds before allocating foundation grant dollars to recipient organizations, foundations which do reduce grant requests account for 91.1% of total foundation health R & D grant dollars. Among foundations which do not support health R & D two out-of three foundations reduce requests for funds before allocations are made. Foundations which do reduce requests are three times more likely to support health R & D than those which do not. (See Table XXXIV).

Most foundations which support health R & D order grant requests by priority and then allocate available foundation grant dollars by this ordering until no more funds are available. Yet foundations which do allocate their available grant dollars in this manner account for only 30.6% of total foundation health R & D grant dollars. The larger foundations which support health R & D thus clearly do not allocate their available grant dollars in this way. (See Table XXXV).

Neither foundations which support health R & D, nor those which do not, allocate all of their available grant dollars at one point in time. Over 78% of foundations which support health R & D, accounting for 82% of total foundation health R & D grant dollars, do not allocate all of their available grant dollars at one point in time, but

TABLE XXXIV

REDUCTION OF GRANT REQUESTS BEFORE ALLOCATIONS ARE MADE

AND SUPPORT OF HEALTH R & D

Type of Foundation	n in sample	1	2	3	4	5
Foundations which sometimes reduce requests for funds before allocations are made	101	70.2	20.5	88.6	66.6	91.1
Foundations which do not reduce requests for funds before allocations are made	21	29.8	6.2	11.4	33.4	8.9
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXXV

ORDERING GRANT REQUESTS BY PRIORITY AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations which order grant requests by priority and allocate available dollars in that order	40	49.1	18.6	55.8	47.8	30.6
Foundations which do not order grant requests by priority and allocate available dollars in that order	81	50.9	14.2	44.2	52.2	69.4
Totals:	121	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question.

rather make allocations over a period of time. (See Table XXXVI).

6.9 EFFECT OF THE TAX LAWS ON FOUNDATION SUPPORT OF HEALTH R & D

The Tax Reform Act of 1969 legislated important changes in the treatment of private non-profit foundations. Two of the most important changes were:

- The imposition of a requirement that each year tax-exempt foundations minimally distribute to qualified organizations a given percentage of the market value of the foundation's assets. This percentage is a floating percentage which is designed to reflect "money rates and investment yields"; in 1974 it amounted to 6% of the market value of a foundation's assets. This requirement, Section 4942 of the Internal Revenue Code, is known as the "Minimum Distribution Requirement."

- The imposition of a 4% excise tax on the investment income of tax-exempt foundations (Section 4940 of the Internal Revenue Code).

Four questions in the survey dealt with the effect of recent revisions in the tax laws on foundations. Specifically, foundations were asked whether the following statements are applicable to them: (1) "Tax laws on distribution have had a significant effect on how much the foundation allocates each year." (Part I, Q. 12j)

(2) "The tax laws on distribution have led to significant changes in foundation investment policy." (Part I, Q. 12L)

TABLE XXXVI

ALLOCATING ALL AVAILABLE GRANT DOLLARS AT ONE POINT IN TIME

AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations which allocate all available grant dollars at one point in time	23	25.4	13.6	21.1	26.2	17.9
Foundations which do not allocate all available grant dollars at one point in time	99	74.6	17.3	78.9	73.8	82.1
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

(3) "The tax laws have led to the utilization of capital to meet minimum distribution requirements." (Part I, Q. 12m) and

(4) "Revisions in the tax laws have resulted in effective liquidation or dormancy of the foundation." (Part I, Q. 12k).

We discuss in turn foundation responses to each of these statements.

Over 38% of foundations which support health R & D, accounting for 39.7% of total foundation health R & D grant dollars, have been affected by the tax laws on distribution in regard to the foundation's total yearly grant allocations. Among foundations which do not support health R & D, 54.4% of the foundations have been affected by the tax laws on distributions in this regard. Foundations whose yearly allocations have not been affected by the tax laws on distributions are approximately 175% more likely to support health R & D than those which have not been so affected. (See Table XXXVII).

Although the tax distribution laws have a significant impact upon foundations' yearly allocations, they have a lesser impact on foundation investment policy. Only in 15.4% of the foundations which support health R & D (foundations which account for 25.6% of health R & D grant dollars) have the tax distribution laws affected foundation investment policy. Foundations which have not been affected by the tax laws in this regard are almost twice as much more likely to support health R & D than those which have been affected. (See Table XXXVIII).

Among foundations which support health R & D, the tax laws

TABLE XXXVII

EFFECT OF TAX LAWS ON DISTRIBUTION ON FOUNDATION

ALLOCATIONS AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations whose yearly total allocations have been affected by distribution tax laws	52	51.8	12.0	38.2	54.4	39.7
Foundations whose yearly total allocations have not been affected by distribution tax laws	70	48.2	20.8	61.8	45.6	60.3
Totals	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XXXVIII

EFFECT OF TAX LAWS ON DISTRIBUTION ON FOUNDATION

INVESTMENT POLICY AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations in which tax laws on distribution have affected investment policy	30	25.2	10.0	15.4	27.1	25.6
Foundations in which tax laws on distribution have not affected investment policy	91	74.8	19.0	84.6	72.9	74.4
Totals:	121	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

on distribution have led to foundation capital utilization in six out of ten cases. This effect is apparently more pronounced among smaller foundations, for the foundations which have been so affected account for only 34.5% of total foundation health R & D grant dollars. Foundations which do not support health R & D are much less likely to have been affected in regard to capital utilization by the tax laws on distribution. In fact, foundations which have not used capital as a result of the revised tax laws are one fourth as likely to support health R & D than those which have been so affected. (See Table XXXIX).

In exceedingly few cases have the revised tax laws led to effective liquidation or dormancy of the foundation. Only 2.4% of the foundations which support health R & D (accounting for 1.1% of the total foundation health R & D grant dollars in 1974) have been so affected; the comparable figure for foundations which do not support health R & D is only very slightly higher — 3.4%. (See Table XL).

6.10 THUMBNAIL SKETCH OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

Table XLI presents a summary description of foundations which support health R & D based upon material presented in Sections 5 and 6, both weighted by the number of foundations in each stratification cell, and by the estimated health R & D grant dollars of each stratification cell. Please note that if only one response is called for by the survey, only one foundation response is recorded in Table XLI; if multiple responses are requested, multiple responses are recorded in Table XLI.

TABLE XXXIX

EFFECT OF TAX LAWS ON DISTRIBUTION

ON FOUNDATION CAPITAL UTILIZATION AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations in which tax laws on distribution have led to capital utilization	35	27.3	35.2	60.1	21.1	34.5
Foundations in which tax laws on distribution have not led to capital utilization	86	72.7	8.8	39.9	78.9	65.5
Totals:	121	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of total foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundations as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XL

DORMANCY OR EFFECTIVE LIQUIDATION OF FOUNDATION

DUE TO TAX LAW REVISIONS AND SUPPORT OF HEALTH R & D

Type of foundation	n in sample	1	2	3	4	5
Foundations which have become dormant or effectively liquidated due to changes in the tax laws	5	3.2	12.1	2.4	3.4	1.1
Foundations which have not become dormant or effectively liquidated due to changes in the tax laws	117	96.8	16.4	97.6	96.6	98.9
Totals:	122	100.0	16.0*	100.0	100.0	100.0

Legend:

1 Type of foundation as percent of foundations in universe

2 Percent of total foundations in universe of given type which support health R & D

3 Type of foundation as percent of foundations which support health R & D

4 Type of foundation as percent of foundations which do not support health R & D

5 Percent of total foundation health R & D grant dollars accounted for by foundations of given type

*Estimate based on total sample, not only on foundations responding to question

TABLE XLI

SHORT DESCRIPTION OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

Variable	Characterization of foundations which support health R&D, weighted by number of foundations	Characterization of foundations which support health R&D, weighted by health R&D grant dollars
1. Stratum	IV	I
2. Does foundation support intramural health R & D?	No	No
3. Type of foundation	Private non-profit other than community, company sponsored or operating	Private non-profit other than community, company sponsored or operating
4. Age of foundation	10 years or less	21-30 years old
5. Location of foundation	New York State	New York State
6. Does foundation have written program policy?	No	Yes
7. Is foundation committed to health R & D?	No	No
8. Basis for commitment to health R & D	Foundation policy	Foundation policy
9. Factors influencing level of funding for health R & D, as identified by the foundations themselves	Changes in interest to or from health R&D, current public issues, and recent developments in field of health	Foundation goals or objectives, number or quality of competitive requests for funding received and recent developments in field of health
10. Active foundation grant areas	Educational programs, welfare, and health R & D	Educational programs, health other than R&D, and health R&D

continued:

TABLE XLI

SHORT DESCRIPTION OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

Variable	Characterization of foundations which support health R&D, weighted by number of foundations	Characterization of foundations which support health R&D, weighted by health R&D grant dollars
11. Does foundation accept health R & D grant proposals?	Yes	Yes
12. Type of personnel who evaluate grants	Outside consultants	Paid staff of foundation
13. Who makes final decisions on grants?	Board of directors or trustees of foundation	Board of directors or trustees of foundation
14. Are specific budget allocations drawn up for particular funding areas?	No	Yes
15. Does foundation have predetermined limit on available grant dollars?	Yes	Yes
16. Does foundation allocate additional monies if there is excess of worthy requests?	Yes	No
17. Are available grant dollars sometimes not allocated because of a lack of worthy requests?	No	No
18. Is total foundation giving based on broad foundation goals and objectives?	Yes	Yes
19. Does foundation decide on each grant request independently of all other grant requests?	Yes	Yes
20. Does foundation simultaneously weight grant requests against each other?	Yes	No

TABLE XLI

(continued):

SHORT DESCRIPTION OF FOUNDATIONS WHICH SUPPORT HEALTH R & D

Variable	Characterization of foundations which support health R&D, weighted by number of foundations	Characterization of foundations which support health R&D, weighted by health R&D grant dollars
21. Does foundation sometimes reduce requests for funds before allocations are made?	Yes	Yes
22. Does foundation order grant requests by priority and allocate available grant dollars in that order?	Yes	No
23. Does foundation allocate all available grant dollars at one point in time?	No	No
24. Have tax laws on distribution affected yearly total allocations?	No	No
25. Have tax laws on distribution affected foundation investment policy?	No	No
26. Have tax laws on distribution led to capital utilization?	Yes	No
27. Have revised tax laws led to effective liquidation or dormancy of foundation?	No	No

7 STABILITY OF FOUNDATION SUPPORT FOR HEALTH R & D

In Section 5 we estimated the level of foundation support for health R & D in 1974 and presented confidence limits for this estimate. Although the level of support in 1974 is of interest by itself, of equal if not greater import to the analysis of foundation grant activities in the field of health R & D is the delineation of any changes in the level of support that have taken place prior and subsequent to 1974, and the factors associated with these changes. It is only when such changes are taken into consideration that accurate projections of future foundation support may be made. This Section addresses the question of changes in the level of foundation support for health R & D; that is, the stability of foundation support for this field of interest.

In order to ascertain the stability of foundation support for health R & D, foundations sampled in the mail survey were asked the following two questions: "Using HEALTH R & D grant dollars (Q. 3) and total internal HEALTH R & D expenses* (Q. 4a) paid out in 1974 as a base figure (i.e. 1974 is 100%), what was the level of HEALTH R & D dollars paid out in 1976 [1972], relative to 1974 HEALTH R & D dollars?" The answer categories provided for these two questions were: 0% (none in 1972/1976), 25%, 50% (half as much as 1974), 75%, 100% (same as 1974), 125%, 150% (half again as much as 1974), 175%, 200% (twice as much as 1974), and 200+ %. The analysis of foundation responses to these questions was based upon a typology of stability support, the

*I.e., intramural health R & D

development of which is described below.

7.1 TYPOLOGY OF STABILITY OF FOUNDATION SUPPORT FOR HEALTH R & D

If we plot foundation support of health R & D in 1972 (expressed as a percentage of 1974 support) against foundation support in 1976 (expressed as a percentage of 1974 support) we may distinguish nine basic patterns of foundation support, as depicted in Figure I. Three of these patterns represent foundations which are currently moving away from support of health R & D:

- The upper left-hand section of Figure I (Pattern #1) represents foundations whose support of health R & D has been unstable, with a current trend of decreasing support of health R & D.

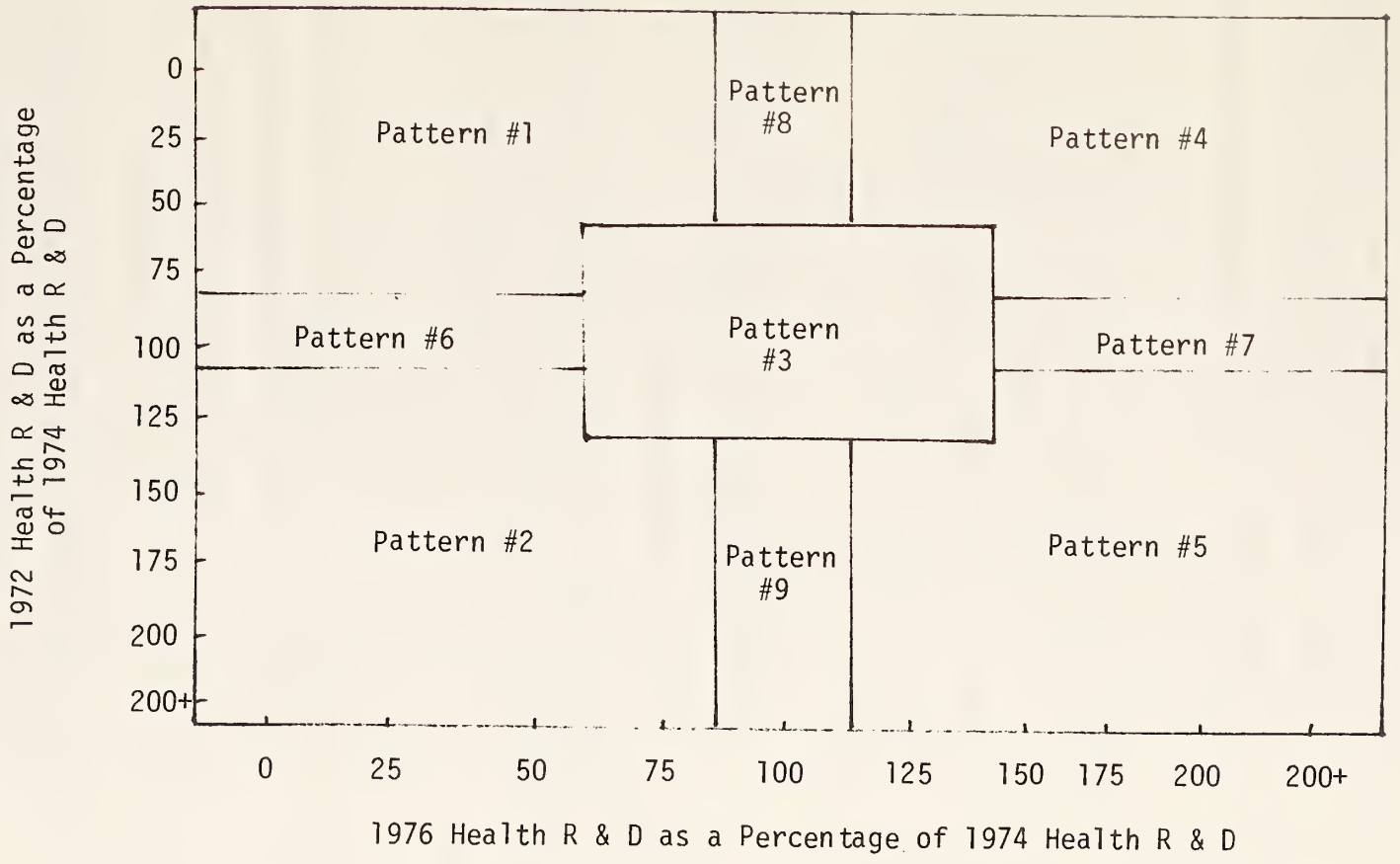
- The middle left-hand section of Figure I (pattern #6) represents foundations which were stable in their support of health R & D from 1972 to 1974, but whose support of health R & D in 1976 declined.

- The lower left-hand section of Figure I (pattern #2) represents foundations whose support of health R & D has been steadily decreasing from 1972 levels.

Three of the basic nine patterns represent foundations which are characterized by a current trend towards increasing support of health R & D:

FIGURE #1

TYPOLOGY OF STABILITY OF FOUNDATION SUPPORT FOR HEALTH R & D*



*See text for explanation

- The lower right-hand section of Figure I (pattern #5) represents foundations whose support of health R & D has been unstable, with a current trend of increasing support of health R & D.

- The middle right-hand section of Figure I (pattern #7) represents foundations which were stable in their support of health R & D from 1972 to 1974, but whose support of health R & D increased in 1976.

- The upper right-hand section of Figure I (pattern #4) represents foundations whose support of health R & D has been steadily increasing since 1972.

Finally, three of the patterns represent foundations whose support of health R & D, at least in the last few years, has been stable:

- The middle of the upper portion of Figure I (pattern #8) represents foundations which increased their support of health R & D from 1972 to 1974, but whose level of support did not change from 1974 to 1976.

- The middle of the lower portion of Figure I (pattern #9) represents foundations which decreased their support of health R & D from 1972 to 1974, but whose reduced level of support did not change from 1974 to 1976.

- The middle of Figure I (pattern #3) represents foundations

which were basically stable in their support of health R & D from 1972 to 1976.

The exact boundaries in Figure I for each of these nine patterns are of course arbitrary. We felt that the boundaries of pattern #3 (stable support of health R & D from 1972 to 1976) should be broadly defined so that relatively minor fluctuations in foundation support of health R & D (due, for example, to such factors as inflation or to decreased foundation income) should not lead to a foundation being classified as unstable in its support of health R & D.

7.2 DISTRIBUTION OF FOUNDATIONS BY STABILITY PATTERN

A total of 143 of the 200 foundations which were sampled supplied sufficient information about their 1972, 1974 and 1976 health R & D grants to permit us to classify them according to the stability of their support for health R & D; 62 of these foundations had health R & D grants in 1974 and 81 did not. The foundations which did not support health R & D are overwhelmingly stable in their non-support (i.e., stability pattern #3). Only 2.5% of the sampled foundations which did not have health R & D grants in 1974 stated that they had health R & D grants in 1976 (i.e., stability patterns #5 and #7). These foundations account for only 4.0% of the universe of foundations from which we sampled.

Foundations which did support health R & D in 1974, however, have a much wider range of stability patterns. Column I of Table XLII shows the stability patterns for those foundations in the sample which supported health R & D in 1974. The most frequent pattern among sampled

TABLE XLII

STABILITY PATTERNS OF FOUNDATIONS SUPPORTING HEALTH R & D IN 1974

Stability Pattern	I % of foundations in sample which support health R & D	II % of foundations in universe which support health R & D	III % of estimated total foundation health R & D grant dollars
Patterns denoting movement towards support of health R & D	27.4	31.6	31.0
4	17.7	3.4	20.9
5	8.1	1.2	10.0
7	1.6	27.0	0.1
Patterns denoting movement away from support of health R & D	35.5	19.4	33.2
1	24.2	12.8	23.3
2	8.1	1.8	8.6
6	3.2	4.8	1.3
Patterns denoting stability in support of health R & D	37.1	49.0	35.7
3	25.8	17.6	28.3
8	9.7	31.3	5.3
9	1.6	0.1	2.1
Totals:	100.0	100.0	99.9

foundations (25.8% of sampled foundations) was pattern #3, denoting stability of support from 1972 to 1976. The second most frequent pattern (24.2%) however, was pattern #1, representing instability of support of health R & D, with a current trend away from support; it is followed by pattern #4 (17.7%), denoting instability of support of health R & D, with a current trend towards support. Overall, 31.6% of the sampled foundations had patterns which denote movement towards support of health R & D, 19.4% had patterns which denote movement away from support, and 49.0% had patterns which denote stability in support (at least from 1974 to 1976).

Table XLII also presents: (1) the estimated percentage of foundations in the universe which supported health R & D in 1974 whose support is characterized by the various stability patterns (Column II) and (2) the estimated percentage of total (universe) 1974 health R & D grant dollars which originates from foundations which are characterized by the various stability patterns (Column III).

Columns II and III of Table XV present widely different pictures of the stability of foundation support for health R & D. Nearly one-half of the foundations in the universe which support health R & D have been stable in their support of health R & D (at least from 1974 to 1976), 31.6% have a current trend towards support of health R & D, and only 19.4% have a current trend away from support of health R & D. Yet if we analyze the percentage of health R & D dollars which originate from the foundations which are characterized by the different stability patterns, we discover that only 35.7% of health R & D dollars is "stable"; fully 33.2% of health R & D dollars come from foundations which have a current trend away from support of health R & D and only 31.0% of the health R & D dollars originate from foundations which have a current

trend towards support of health R & D.

7.3 ANALYSIS OF STABILITY OF SUPPORT FOR HEALTH R & D BY TYPE OF GRANT RECIPIENT AND GRANT FOCUS

For each of the various types of recipients we calculated the percentage of the foundation health R & D grant dollars given to that particular type of recipient which were given by foundations characterized by each of the nine stability of support patterns. These percentages are presented in Table XLIII. Nearly 60% of the health R & D grant dollars given to academic institutions originated from foundations which have been stable in their support of health R & D, almost 27% of the academic health R & D grant dollars were given by foundations with a current trend towards increased support of health R & D, and 14% of the academic health R & D grant dollars were given by foundations characterized by a current trend away from support of health R & D.

On the other hand over one-half of the foundation health R & D grant dollars given to medical institutions originate from foundations which are currently moving away from support of health R & D. Only 26.8% of health R & D grant dollars given to medical institutions were given by foundations which are stable in their support of health R & D, and 20.3% were given by foundations with a current trend towards increased support of health R & D. Since medical institutions account for such a large percentage of foundation health R & D grant dollars, it is not surprising that approximately one-third of health R & D grant dollars originate from foundations which are characterized

TABLE XLIII

STABILITY BY TYPE OF GRANT RECIPIENT

Stability Pattern	Type of Recipient 1	2	3	4	5
Patterns denoting movement towards support of health R & D	26.9	20.3	23.3	21.4	7.7
4	24.6	15.4	19.5	20.6	7.7
5	2.3	4.6	3.6	0.8	0.0
6	0.0	0.3	0.2	0.0	0.0
Patterns denoting movement away from support of health R & D	14.0	52.8	35.4	16.3	16.4
1	14.0	46.4	31.9	10.5	14.4
2	0.0	6.4	3.5	2.6	2.0
6	0.0	0.0	0.0	3.2	0.0
Patterns denoting stability in support of health R & D	59.2	26.8	41.3	62.3	76.0
3	42.4	19.8	29.9	53.7	56.9
8	0.0	6.6	3.7	8.6	0.0
9	16.8	0.4	7.7	0.0	19.1
Totals	100.1	99.9	100.0	100.0	100.0

Legend:

1 Percent of foundation health R & D grant dollars given to academic institutions with particular stability pattern

2 Percent of foundation health R & D grant dollars given to medical institutions with particular stability pattern

3 Percent of foundation health R & D grant dollars given to academic and medical institutions with particular stability pattern

4 Percent of foundation health R & D grant dollars given to other private non-profit organizations with particular stability pattern

5 Percent of foundation health R & D grant dollars given to other recipients (i.e. local and State Government, Federal Government, intramural, foreign and industrial recipients) with particular stability pattern

by current movement away from support of health R & D.

Health R & D grant dollars given to other private non-profit organizations and to other types of recipients originate for the most part from foundations which are stable in their support of health R & D. The majority of the remainder of the grant dollars of these two types of recipients originate from foundations moving towards support of health R & D in the case of other private non-profit organizations and away from support of health R & D in the case of other recipients.

When we analyze stability of support for health R & D by grant focus three radically different patterns emerge. Over 70% of the foundation health R & D grant dollars given for biomedical R & D originate from foundations which are stable in their support of health R & D; yet 72% of the remaining health R & D grant dollars given for biomedical R & D were given by foundations which are currently moving away from support of health R & D. The vast majority of delivery R & D grant dollars (73.8%) originate from foundations characterized by a current trend towards increased support of health R & D, with 70% of the remaining health R & D grant dollars coming from foundations currently moving away from support of health R & D. The majority of "other" R & D grant dollars (48.3%) originate from foundations currently moving away from support of health R & D, yet 44.4% of "other" R & D grant dollars were given by foundations characterized by stability in their support of health R & D (See Table XLIV).

TABLE XLIV

STABILITY BY GRANT FOCUS

Stability Pattern	1	2	3
Patterns denoting movement towards support of health R & D	7.9	73.8	7.4
4	4.3	73.4	6.3
5	3.4	0.4	1.1
7	0.2	0.0	0.0
Patterns denoting movement away from support of health R & D	20.6	18.4	48.3
1	13.4	17.6	48.0
2	5.0	0.8	0.3
6	2.2	0.0	0.0
Patterns denoting stability in support of health R & D	71.6	7.8	44.4
3	59.5	5.0	28.7
8	3.0	0.5	14.5
9	9.1	2.3	1.2
Totals	100.1	100.0	100.1

Legend:

1 Percent of foundation health R & D grant dollars given for biomedical R & D with particular stability pattern

2 Percent of foundation health R & D grant dollars given for delivery R & D with particular stability pattern

3 Percent of foundation health grant dollars given for "other" R & D with particular stability pattern

7.4 FACTORS ASSOCIATED WITH THE STABILITY OF FOUNDATION SUPPORT FOR HEALTH R & D

In this section we analyze what factors or variables are associated with the various patterns of present and future support for health R & D. The factors that we review are restricted, of course, to those of which we have knowledge either through the foundation's responses to the survey questions or through our review of publically available information on foundations. We shall concern ourselves only with foundations which supported health R & D in 1974, since the foundations which did not support health R & D in 1974 will have a negligible impact on future support levels.*

The impact of a particular factor or variable was ascertained by cross-tabulating the levels of the factor against the various stability patterns, with each foundation which supported health R & D in 1974 weighted either by the number of foundations in the universe or by health R & D dollars, as described in Section 6.2.

7.4.1 BACKGROUND FACTORS: FOUNDATION STRATUM, TYPE, AGE, AND LOCATION

In general, as foundation size decreases the percentage of foundations in each stratum whose support of health R & D is stable increases. This is true whether we weight the sampled foundations by

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*It may be noted that even if we wanted to analyze the factors associated with foundations which had no health R & D grants in 1974 but which stated that they had health R & D grants in 1976, this would not be possible since there are only two foundations in the sample — far too few to statistically analyze — which fall in this category.

the estimated number of foundations in each stratification cell or by the estimated health R & D grant dollars of these cells. If we combine for analytical purposes the stability of patterns of "moving toward support" of health R & D and "stable in support" of health R & D, we observe that in each stratum this combined category accounts for a majority of health R & D grant dollars. Although in Stratum I these two categories account for approximately 66.5% of stratum health R & D grant dollars, this percentage rises to 72.5% in Stratum III and to 100% in Stratum IV (see Table XLV).

Although sample sizes are small, community foundations appear to be less stable in their support of health R & D than "other private non-profit foundations." Almost two out of three community foundations (accounting for 48.1% of community foundation health R & D grant dollars) are moving away from support of health R & D. Only 18.1% of "other private non-profit foundations" (accounting for 31.1% of "other private non-profit foundation" health R & D grant dollars) have a current trend towards decreased support of health R & D (See Table XLVI).

The age of a foundation may also significantly affect stability of support for health R & D. Over one-half of the foundations ten years old or less and between 21 and 30 years are stable in their support of health R & D; yet 58% of the foundations between 31 and 40 years old and fully 68% of the foundations 41 years old or older are currently moving away from support of health R & D. When we weight foundation stability patterns by the health R & D grant dollars in each stratification cell, a slightly different distribution of stability patterns by age of foundation emerges. Only in the age brackets of

TABLE XLV

STABILITY OF SUPPORT FOR HEALTH R & D BY STRATUM

Stratum	Stability Pattern	n in sample	1	2	3	4
I	Moving towards support	10	1.0	43.5	2.1	43.6
	Moving away from support	7	0.7	30.4	14.7	30.4
	Stable in support	6	0.6	26.1	12.6	26.0
II	Moving towards support	5	2.2	15.5	9.3	24.3
	Moving away from support	10	5.8	40.9	15.5	40.6
	Stable in support	10	6.2	43.7	13.4	35.1
III	Moving towards support	1	1.4	6.0	0.6	5.5
	Moving away from support	5	12.9	55.1	3.0	27.5
	Stable in support	5	9.1	38.9	7.3	67.0
IV	Moving towards support	1	27.0	45.0	0.1	0.4
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	2	33.0	55.0	2.4	96.0
Totals:		62	99.9	-	100.0	-

Legend:

1 Percent of total number of foundations which support health R & D in particular stratum and with a given stability pattern

2 Percent of foundations in stratum which support health R & D with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations in particular stratum with a given stability pattern

4 Percent of stratum foundation health R & D grant dollars accounted for by foundations with a given stability pattern.

TABLE XLVI

STABILITY OF SUPPORT FOR HEALTH R & D BY TYPE OF FOUNDATION

Type of Foundation	Stability Pattern	n in sample	1	2	3	4
Company sponsored	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	0.4	100.0	1.9	100.0
Community	Moving towards support	2	0.5	35.7	4.0	52.0
	Moving away from support	2	0.9	64.3	3.7	48.1
	Stable in support	0	0.0	0.0	0.0	0.0
Operating	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	1	0.4	100.0	1.9	100.0
	Stable in support	0	0.0	0.0	0.0	0.0
Other Private Non-profit	Moving towards support	15	31.1	31.1	27.1	30.6
	Moving away from support	19	18.1	18.5	27.6	31.1
	Stable in support	22	48.5	49.6	33.9	38.3
Totals		62	99.9	-	100.1	-

Legend:

1 Percent of total number of foundations which support health R & D of a particular type and with a given stability pattern

2 Percent of number of foundations which support health R & D of a particular type with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations of a particular type with a given stability pattern

4 Percent of health R & D grant dollars given by foundations of a particular type accounted for by foundations with a given stability pattern

eleven to twenty years old and forty-one years old or older are a majority of the health R & D grant dollars accounted for by foundations which have a current trend towards decreased support of health R & D (See Table XLVII).

The location of a foundation is also associated with stability of support of health R & D. A majority of foundations in the Atlantic Central States and the Southwest have a current trend towards decreased support of health R & D; yet in the Western States fully 84.2% of the foundations are moving towards increased support of health R & D. The foundations in New York State are the most stable in their support of health R & D. If we consider the percentage of health R & D grant dollars in each "location" accounted for by foundations which are either stable in their support of health R & D or are moving towards increased support, the percentage of foundations in a "location" accounted for by these two categories varies from 45.6% in the Atlantic Central States to 90.8% in the Southwest to 100% in the West. In New York State, whose foundations account for over 31% of total (national) foundation health R & D grant dollars, over 66% of the state health R & D grant dollars are accounted for by foundations which are either currently stable in their support of health R & D or moving toward increased support of this field of interest. (See Table XLVIII).

7.4.2 STABILITY OF SUPPORT FOR HEALTH R & D BY WHETHER FOUNDATIONS ARE PART OF THE D.R.A. "POOL" OR ARE "TRACKED" BY D.R.A.

Foundations which are part of the D.R.A. "pool" are atypical of the foundations in the survey universe in that a greater percentage

TABLE XLVII

STABILITY OF SUPPORT FOR HEALTH R & D BY AGE OF FOUNDATION

Age of Foundation	Stability Pattern	n in sample	1	2	3	4
10 years or less	Moving towards support	3	28.5	43.8	2.8	42.4
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	5	36.5	56.2	3.8	57.6
11-20 years	Moving towards support	1	0.4	4.1	1.9	19.4
	Moving away from support	5	6.9	70.4	5.1	52.0
	Stable in support	1	2.5	25.5	2.8	28.6
21-30 years	Moving towards support	5	0.9	6.2	10.3	30.5
	Moving away from support	6	5.9	40.4	9.3	27.5
	Stable in support	9	7.8	53.4	14.2	42.0
31-40 years	Moving towards support	5	1.2	17.9	9.9	39.3
	Moving away from support	4	3.9	58.2	6.5	25.8
	Stable in Support	5	1.6	23.9	8.8	34.9
41 years or more	Moving towards support	3	0.6	15.8	6.1	24.9
	Moving away from support	7	2.6	68.4	12.3	50.2
	Stable in support	3	0.6	15.8	6.1	24.9
Totals		62	99.9	-	99.9	-

Legend

1 Percent of total number of foundations which support health R & D of a particular age and with a given stability pattern

2 Percent of foundations which support health R & D of a particular age with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations of a particular age with a given stability pattern

4 Percent of health R & D grant dollars given by foundations of a particular age with a given stability pattern

4 Percent of health R & D grant dollars given by foundations of a particular age accounted for by foundations with a given stability pattern

TABLE XLVIII

STABILITY OF SUPPORT FOR HEALTH R & D BY LOCATION OF FOUNDATION

Foundation Location*	Stability Pattern	n in sample	1	2	3	4
New England	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	3	4.2	39.3	4.1	50.0
	Stable in support	2	6.5	60.7	4.1	50.0
New York	Moving towards support	4	2.0	4.6	6.7	23.3
	Moving away from support	7	9.2	21.1	9.6	33.4
	Stable in support	10	32.5	74.4	12.4	43.2
Atlantic Central	Moving towards support	3	0.3	13.6	6.3	35.0
	Moving away from support	5	1.5	58.2	9.8	54.4
	Stable in support	1	0.4	18.2	1.9	10.6
Midwest	Moving towards support	5	1.5	18.8	9.8	35.9
	Moving away from support	6	3.0	37.5	8.9	32.6
	Stable in support	4	3.5	43.8	8.6	31.5
West	Moving towards support	2	27.1	84.2	2.2	27.2
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	4	5.1	15.8	5.9	72.8
Southwest	Moving towards support	3	0.6	19.4	6.1	62.2
	Moving away from support	1	1.6	51.6	0.9	9.2
	Stable in support	2	0.9	29.0	3.8	28.6
Totals		62	99.9	-	100.1	-

Legend:

1 Percent of total number of foundations which support health R & D in a particular location with a given stability pattern

2 Percent of foundations in a particular location which support health R & D with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations in a particular location and with a given stability pattern

4 Percent of health R & D grant dollars given by foundations in a particular location accounted for by foundations of a given stability pattern

*Since we believe that the foundations in the Southern states have virtually no health R & D grants, they are not included in this table.

of the foundations in the pool are moving towards support of health R & D than the sample universe in general and a lesser percentage of them are moving away from support of health R & D than is typical for the sample universe in general. The same pattern is true if we consider foundations which D.R.A. follows and those which it does not follow; the foundations which D.R.A. tracks have a higher percentage of foundations which are moving towards support of health R & D and a lower percentage of foundations moving away from support of health R & D than the universe in general. Additionally, foundations in the D.R.A. "pool" are much more stable in their support of health R & D than the foundations not in the pool. The latter, of course, account for 98.8% of the foundations in the universe of foundations from which the mail survey sample was drawn. If we focus on foundation stability patterns weighted by the health R & D dollars in each stratification cell, the same over- and under-representations in the D.R.A. "pool" and foundations which the D.R.A. tracks vis-a-vis the foundations are not tracked or in the "pool" is evident (see Table XLVIX).

7.4.3 STABILITY OF SUPPORT FOR HEALTH R & D BY MOST IMPORTANCE INFLUENCE ON LEVEL OF HEALTH R & D FUNDING AND BY MOST IMPORTANT FOUNDATION ACTIVE GRANT AREA

Foundations who were included in the mail survey were asked to identify the most important influence on their level of funding for health R & D. The primary influence on the level of health R & D funding appears to be significantly associated with stability of support for health R & D. Foundations in the universe which would identify "recent developments in the field of health" or "amount of gifts or contributions

TABLE XLVIX

STABILITY OF SUPPORT FOR HEALTH R & D

BY WHETHER FOUNDATIONS ARE PART OF D.R.A. "POOL" OR ARE "TRACKED" BY D.R.A.

Type of Foundation	Stability Pattern	1	2	3	4
Foundations which are part of D.R.A. pool	Moving towards support	3	33.3	19.3	34.2
	Moving away from support	1	11.1	27.5	10.1
	Stable in support	5	55.6	53.2	55.7
Foundations which are not part of D.R.A. pool	Moving towards support	14	26.4	31.9	30.4
	Moving away from support	21	39.6	19.3	38.5
	Stable in support	18	34.0	48.9	31.2
Foundations which are tracked by D.R.A.	Moving towards support	6	35.3	22.4	36.0
	Moving away from support	5	29.4	43.0	28.6
	Stable in support	6	35.3	34.5	35.3
Foundations which are not tracked by D.R.A.	Moving towards support	11	24.4	31.9	28.3
	Moving away from support	17	37.8	18.8	35.7
	Stable in support	17	37.8	49.4	35.9

Legend:

1 Number of foundations sampled which support health R & D which are of a particular type and have a given stability pattern

2 Percent of sampled foundations which support health R & D of a particular type with a given stability pattern

3 Percent of foundations which support health R & D of a particular type with a given stability pattern, weighted by the number of foundations in each stratification cell

4 Percent of foundations which support health R & D of a particular type with a given stability pattern, weighted by the estimated foundation health R & D grant dollars in each stratification cell

received" as the most important influence are the most stable in their support of health R & D and foundations which would identify "number of quality of competitive requests for funding received" or "changes in interest to or from health R & D" are the least stable.* The same pattern is found if we weight foundation responses by foundation health R & D grant dollars in each stratification cell. Foundations in the universe which would identify "number or quality of competitive requests for funding received" or "foundation goals and objectives" as the primary influence on level of funding for health R & D are the most likely to have a current trend towards increased support of health R & D, while foundations which would identify "changes in interest to or from health R & D" or "number or quality of competitive requests for funding received" are the most likely to have a current trend towards decreased support of health R & D. (See Table L).

The most active grant area identified by foundations is also strongly associated with stability of support for health R & D. Not surprisingly, over 90.5% of foundations whose most important grant area is health R & D (accounting for 8.8% of total health R & D grant dollars) are stable in their support of health R & D, and over 81.1% of

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*We refrain from commenting upon "primary influences" for which there are fewer than five observations in the sample.

TABLE L

STABILITY OF SUPPORT FOR HEALTH R & D BY MOST IMPORTANT INFLUENCE

ON LEVEL OF FOUNDATION FUNDING FOR HEALTH R & D, AS IDENTIFIED BY THE FOUNDATIONS THEMSELVES

Most important influence factor	Stability Pattern	n in sample	9	10	11	12
1	Moving towards support	1	0.2	1.2	2.2	29.3
	Moving away from support	2	5.4	32.9	2.3	30.7
	Stable in support	2	10.8	65.9	3.0	40.0
2	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	2	1.3	100.0	2.9	100.0
3	Moving towards support	2	2.1	27.6	2.8	20.6
	Moving away from support	4	2.9	38.2	6.5	47.8
	Stable in support	3	2.6	34.2	4.3	31.6
4	Moving towards support	7	1.6	8.6	15.0	30.6
	Moving away from support	10	9.3	50.3	18.3	37.3
	Stable in support	8	7.6	40.1	15.7	32.0
5	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	1.1	100.0	0.7	100.0
6	Moving towards support	5	2.3	22.1	10.1	67.3
	Moving away from support	3	6.1	58.7	4.3	28.7
	Stable in support	1	2.0	19.2	0.6	4.0
7	Moving towards support	1	0.6	1.5	1.9	22.6
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	4	40.5	98.5	6.5	77.4
8	Moving towards support	0	0.0	0.0	0.0	0.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	3.7	100.0	2.9	100.0
Totals:		57	100.1	-	100.0	-

Legend:

1 Amount of gifts or contributions received
2 Return on investment in prior years
3 Change in interest to or from health R & D
4 Foundation goals and objectives
5 I.R.S. minimum distribution requirements
6 Number or quality of competitive requests for funding received
7 Recent developments in field of health
8 Other
9 Percent of total number of foundations supporting health R & D which would identify factor as most important influence and with a given stability pattern
10 Percent of foundations supporting health R & D which would identify factor as most important influence with a given stability pattern
11 Percent of total foundation health R & D grant dollars accounted for by foundations which would identify factor as most important influence and with a given stability pattern
12 Percent of health R & D grant dollars given by foundations which would identify factor as most important influence accounted for by foundations with a particular stability pattern

foundations which would identify "educational programs" as their most important active grant area (accounting for 14.4% of total health R & D grant dollars) are stable in their support of health R & D. Foundations which would identify "welfare" or "other" as their most important active grant area tend to be at least stable in their support of health R & D.* The same pattern is true if we weight foundation responses by health R & D grant dollars, except that "health other than R & D" replaces "other" as the second most unstable active grant area. When weighted by grant dollars, "welfare" and "educational programs" are the active grant areas associated with the highest percentages of foundations moving towards support of health R & D (See Table LI).

7.4.4 STABILITY OF SUPPORT FOR HEALTH R & D BY TYPE OF FOUNDATION PERSONNEL RESPONSIBLE FOR GRANT EVALUATION

Foundations were asked about the type of personnel responsible for the evaluation of grant proposals. Foundations in which grant proposals are evaluated by a small family group or by "other" personnel are most likely to be stable in their support of health R & D, while foundations in which grants are evaluated by both outside consultants and the paid staff of the foundation are the least likely to be stable in their support of health R & D.** Foundations in which grant proposals

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*Again we refrain from commenting upon active grant areas for which there are fewer than five observations in the sample

**We again do not discuss categories of personnel responsible for grant evaluation for which there are fewer than five observations in the sample.

TABLE LI

STABILITY OF SUPPORT FOR HEALTH R & D BY MOST IMPORTANT ACTIVE GRANT AREA

Most important foundation active grant area	Stability pattern	n in sample	1	2	3	4
Welfare	Moving towards support	2	0.4	16.7	4.4	34.9
	Moving away from support	3	1.4	58.3	6.2	49.2
	Stable in support	1	0.6	25.0	2.0	15.9
Health R & D	Moving towards support	2	0.9	5.3	4.2	28.0
	Moving away from support	1	0.7	4.1	2.0	13.3
	Stable in support	5	15.3	90.5	8.8	58.7
Health other than R & D	Moving towards support	2	2.2	32.4	2.8	24.8
	Moving away from support	3	2.0	29.4	5.9	52.2
	Stable in support	2	2.6	38.2	2.6	23.0
Humanities	Moving towards support	1	0.2	2.4	2.2	59.5
	Moving away from support	2	6.2	73.8	0.9	24.3
	Stable in support	1	2.0	23.8	0.6	16.2
Sciences	Moving towards support	1	0.2	50.0	2.2	50.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	0.2	50.0	2.2	50.0
Educational Programs	Moving towards support	6	2.5	4.4	12.6	34.1
	Moving away from support	6	8.2	14.4	10.0	27.0
	Stable in support	8	46.0	81.1	14.4	38.9
Other	Moving towards support	1	0.2	2.4	2.2	13.8
	Moving away from support	5	5.9	69.4	9.1	56.9
	Stable in support	3	2.4	28.2	4.7	29.4
Totals		56	100.1	-	100.0	-

Legend:

1 Percent of total number of foundations supporting health R & D for which area is most important active grant area and with a given stability pattern

2 Percent of foundations supporting health R & D for which area is most important active grant area with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations for which area is most important active grant area and with a given stability pattern

4 Percent of health R & D grant dollars given by foundations for which area is most important active grant area accounted for by foundations with a given stability pattern

are evaluated by both outside consultants and the paid foundation staff or by the paid staff alone are the most likely to have a trend towards decreased support of health R & D. The same general pattern holds true if we weight foundation responses by the health R & D grant dollars of each stratification cell (See Table LII).

7.4.5 EFFECT OF REVISIONS IN THE TAX LAWS ON STABILITY OF SUPPORT FOR HEALTH R & D

Foundations included in the mail survey were queried as to the impact recent changes in the tax laws on foundations have had upon them. Foundations in which the total amount of foundation allocations has not been affected by recent revisions in the tax laws are more likely to be stable in their support of health R & D than those whose total allocations have been so affected. Additionally, foundations whose total allocations have not be affected by the recent revisions in the tax laws are less likely to have a current trend toward decreased support of health R & D. If we weight foundation responses by health R & D grant dollars, a slightly different picture of the affect of tax law revisions on stability of support for health R & D emerges: foundations whose total allocations have been affected by these changes are more likely to be more stable in their support of health R & D, yet paradoxically also more likely to be moving away from support of health R & D than foundations whose total allocations have not been affected by tax law changes (see Table LIII).

Foundations whose investment policy has been affected by tax law revisions are more likely to be stable in their support of health

TABLE LII

STABILITY OF SUPPORT FOR HEALTH R & D BY TYPE OF FOUNDATION PERSONNEL RESPONSIBLE FOR GRANT EVALUATION

Type of foundation personnel responsible for grant evaluation	Stability pattern	n in sample	1	2	3	4
A single unpaid officer	Moving toward support	0	0.0	0.0	0.0	0.0
	Moving away from support	1	4.7	72.3	0.4	66.7
	Stable in support	1	1.8	27.7	0.2	33.3
A small family group	Moving toward support	1	2.0	9.7	0.6	8.7
	Moving away from support	3	6.8	32.9	2.7	39.1
	Stable in support	3	11.9	57.5	3.6	52.2
A single paid executive	Moving toward support	2	1.3	68.4	3.8	66.7
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	0.6	31.6	1.9	33.3
Paid foundation staff	Moving toward support	5	0.8	15.1	10.7	27.1
	Moving away from support	9	2.8	52.8	18.6	47.1
	Stable in support	5	1.7	32.1	10.2	25.8
Outside consultants	Moving toward support	0	0.0	0.0	0.0	0.0
	Moving away from support	0	0.0	0.0	0.0	0.0
	Stable in support	1	39.3	100.0	0.1	100.0
Outside consultants and paid staff	Moving toward support	3	0.5	17.9	6.4	34.8
	Moving away from support	4	2.1	75.0	7.8	42.4
	Stable in support	2	0.2	7.1	4.2	22.8
Other	Moving toward support	5	2.2	9.4	10.0	34.8
	Moving away from support	3	7.7	32.9	3.2	11.2
	Stable in support	9	13.5	57.7	15.5	54.0
Totals		58	99.9	-	99.9	-

Legend:

1 Percent of total number of foundations which support health R & D in which a particular type of personnel are responsible for grant evaluation and with a given stability pattern

2 Percent of foundations which support health R & D in which a particular type of personnel evaluate grants with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations in which a particular type of personnel evaluate grants and with a given stability pattern

4 Percent of health R & D grant dollars given by foundations in which a particular type of personnel evaluate grants accounted for by foundations with a given stability pattern

TABLE LIII

STABILITY OF SUPPORT FOR HEALTH R & D BY

WHETHER TAX LAWS ON DISTRIBUTION HAVE AFFECTED FOUNDATION ALLOCATIONS

Type of foundation	Stability pattern	n in sample	1	2	3	4
Foundations where tax laws on distribution have affected foundation allocations	Moving toward support	5	2.6	6.8	9.1	23.1
	Moving away from support	9	13.6	35.7	14.1	35.8
	Stable in support	11	21.8	57.4	16.2	41.1
Foundations where tax laws on distribution have not affected foundation allocations	Moving toward support	11	4.1	6.6	22.4	36.9
	Moving away from support	11	10.5	16.9	18.7	30.8
	Stable in support	11	47.4	76.5	19.6	32.3
Totals		58	100.0	-	100.1	-

Legend:

1 Percent of total number of foundations supporting health R & D of a particular type and with a given stability pattern
2 Percent of foundations supporting health R & D of a particular type with a given stability pattern
3 Percent of total foundation health R & D grant dollars accounted for by foundations of a particular type and with a given stability pattern
4 Percent of health R & D grant dollars given by foundations of a particular type accounted for by foundations with a given stability pattern

R & D than those whose policy has not been so affected. Additionally, foundations whose investment policy has been affected by tax law changes are also less likely to have a current trend toward decreased support of health R & D. This latter difference nearly disappears if we weight foundation responses by health R & D grant dollars. (See Table LIV). The tax law revisions in regard to the imposition of minimum distribution requirements are associated with increased stability of support if we consider the number of foundations in each stratification cell, yet are associated with decreased stability of support if we consider the health R & D grant dollars of these cells. Further, although foundations who have had to utilize capital in response to minimum distribution requirements are less likely to have a trend towards decreased support of health R & D than those which have not been so affected, capital utilization is associated with a greater likelihood of decreased support of health R & D when the health grant dollars involved are considered. (See Table LV).

Overall, if we weight foundation responses by health R & D grant dollars, foundations which have been affected by tax law revisions are more likely to be stable in their support of health R & D than those which have not been so affected, except in instances in which the tax law revisions have led to capital utilization.

TABLE LIV

STABILITY OF SUPPORT FOR HEALTH R & D BY WHETHER

FOUNDATION'S INVESTMENT POLICY HAS BEEN AFFECTED BY REVISIONS IN THE TAX LAWS

Type of foundation	Stability pattern	n in in sample	1	2	3	4
Foundation whose investment policy has been affected by tax law revisions	Moving towards support	3	0.9	7.3	6.2	23.9
	Moving away from support	4	1.5	12.2	8.1	31.3
	Stable in support	8	9.9	80.5	11.6	44.8
Foundations whose investment policy has not been affected by tax law revisions	Moving towards support	13	5.7	6.5	25.3	34.1
	Moving away from support	16	22.5	25.7	24.7	33.3
	Stable in support	14	59.3	67.8	24.1	32.5
Totals		58	99.8	-	100.0	-

Legend:

1 Percent of total number of foundations supporting health R & D of a particular type and with a given stability pattern

2 Percent of foundations supporting health R & D of a particular type with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations of a particular type and with a given stability pattern

4 Percent of health R & D grant dollars given by foundations of a particular type, accounted for by foundations with a given stability pattern

TABLE LV

STABILITY OF SUPPORT FOR HEALTH R & D BY WHETHER

MINIMUM DISTRIBUTION REQUIREMENTS HAVE LED TO CAPITAL UTILIZATION

Type of foundation	Stability pattern	n in sample	1	2	3	4
Foundations in which minimum distribution requirements have led to capital utilization	Moving towards support	7	3.8	6.1	12.9	35.7
	Moving away from support	8	11.4	18.2	13.1	36.3
	Stable in support	7	47.4	75.7	10.1	28.0
Foundations in which minimum distribution requirements have not led to capital utilization	Moving towards support	9	2.8	7.5	18.5	29.0
	Moving away from support	12	12.8	34.3	19.5	30.6
	Stable in support	15	21.7	58.2	25.7	40.3
Totals		58	99.9	-	99.8	-

Legend:

1 Percent of total number of foundations supporting health R & D of a particular type and with a given stability pattern

2 Percent of foundations supporting health R & D of a particular type with a given stability pattern

3 Percent of total foundation health R & D grant dollars accounted for by foundations of a particular type and with a given stability pattern

4 Percent of health R & D grant dollars given by foundations of a particular type accounted for by foundations with a given stability pattern

8 RECOMMENDATIONS

It seems clear that there should be some revision in the current NIH/DRA procedures for estimating foundation giving to Health R & D. While the DRA estimate may not be outside of the more tightly drawn confidence limits of this survey, it is based on a much smaller sample than the current estimate, and provides a substantially different total estimate of health R & D. Given the larger number of foundations and the more systematic methods by which they were selected in this study, a rational statistician must opt for the estimate provided herein as opposed to that provided by the NIH/DRA pool, independent of the absolute statistical confidence limits for the latter or the statistical significance of the difference between the two.

The operational question for the DRA is, then, what changes in procedure might be appropriate in making annual NIH/DRA estimates based on what was learned from this study.

The classes of options include:

1. Changing the historically derived multiplier used for the DRA Pool
2. Changing the composition of the Pool
3. Conducting mail studies similar to the one described herein, on a periodic basis.

We address these options in turn.

8.1 CHANGING THE MULTIPLIER

First it seems appropriate to make a formal change in the procedure and in the multiplier used by the DRA, to correct the total estimate of giving to health R & D by foundations to make it more like the value estimated in this study, as opposed to the value estimated from the DRA pool.

It may be recalled that the DRA review of its pool foundations identified more health R & D dollars than did the original COOPER AND COMPANY pre-mailing review. Further, the mail survey resulted in substantially less health R & D dollars on a foundation by foundation basis. Yet in aggregate the mail survey estimate of health R & D dollars is much larger than the DRA estimate.

Thus it would appear that two changes are required:

1. A review of the DRA criteria for identifying grants, consistent with the discussions in this report concerning the definitions of health R & D.* This review should, in turn, consider two subjects:

   a. The "gray" areas in the definition.

   b. The question of restriction** of the grants to research.

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*It is our understanding that this recommendation has been implemented, and that the DRA criteria used in estimating 1975 Health R & D giving by foundations incorporated the new, sharpened definitions.

**Many grants that seemed to have otherwise qualified as health R & D were not specifically restricted to R & D, as we discovered from the survey.

2. A revision (increase) in the multiplier to account, again, for two phenomena:
   a. The smaller estimated giving to health R & D in each foundation, on the average (because of (1) above)
   b. The overall increase in estimated giving resulting from the recognition that many more foundations contribute to health R & D.

Based upon the review of available grant data we estimate that the 24 foundations in the DRA pool* had made 28.63 million in health R & D grants in 1974. The mail survey disclosed that in 1974 private non-profit foundations made a total of $78.89 million in grants for the purposes of health R & D. Assuming that the composition of the DRA "pool" remains unchanged, the "pool" total for health R & D grant dollars must therefore be multiplied by 2.76 in order to arrive at a universe estimate of total foundation support for health R & D. This multiplier is then applicable to the 1975 and later DRA pool estimates using the revised criteria for identifying health R & D grants.

8.2 CHANGING THE COMPOSITION OF THE POOL

With respect to changing the composition of the pool, it is clear that a not insignificant portion of health R & D dollars comes from the third and fourth strata we sampled, whereas the DRA pool has no foundations in Stratum IV and only 3 foundations in Stratum III. Since it is our estimate that over 20 million dollars, or about 25% of the health R & D dollars come from Stratum III and about 5 million dollars, or about 7%, from Stratum IV, we believe that the DRA pool would be more representative if more foundations in the latter strata were included.

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* See Table VI.

More specifically, we would broaden the pool from 24 to 34 foundations by adding at least 5 more from Stratum III and at least 5 from Stratum IV. Finally, we recommend the following foundations as candidates for inclusion in the pool, based on review of their extant data:

Stratum III - Pauline Steine Wolff Memorial Foundation (Texas)
- Stoddard Charitable Trust (Massachusetts)
- Ausbury Foundation (New York)
- Hamilton Roddis Foundation (Wisconsin)
- Robert Glenn Rapp Foundation (Oklahoma)

Stratum IV - Andres Soriano Cancer Research Fund (Connecticut)
- Brookline Tuberculosis and Health Society (Massachusetts)
- La Salle Steel Foundation (Illinois)
- Crippled Children's Friendly Aid Association (James and Maria Harriott, Inc.) (New York)
- H. Herbert Myers Memorial Foundation (New York)

Since only some of these foundations publish annual reports, it may be necessary to contact some of them by telephone after their IRS 990 forms have been reviewed.

8.3 CONDUCTING PERIODIC MAIL SURVEYS

The final issue has to do with whether or not it is appropriate for DRA to conduct annual or periodic mail surveys such as the one described herein. The one overriding factor in this regard seems to be that foundation giving to health R & D (based on either the DRA

pool or the COOPER AND COMPANY survey) has not changed dramatically, in the aggregate. There has been very slow growth over the years, but nothing that would warrant annual expensive surveys. This does not mean, however, that at least every four or five years DRA ought not to verify or improve its estimation methodology by some alternative process (interviews with its pool foundations, broader mail surveys, or even required reporting).

This judgment that a broad scale annual survey is not necessary should not be construed as limiting other surveys or further research in related areas, which we discuss below.

8.4 FURTHER RESEARCH

No research study would be complete without identifying insights into additional questions for research. It is almost inconceivable that any research professional "worth his salt" would be entirely satisfied with what he had done in every respect so that there were no nagging questions left. Further, it is also inconceivable that good research would not turn over as many new questions as it "solved."

We would indeed have no trouble in developing a rather long additional shopping list of research questions about health R & D giving by foundations, on which the evidence is thin. Our objective, on the contrary, is to identify some key topics, which will have substantial payoff to DRA.

In this regard we believe it is a primary need for DRA to be

able to identify significant changes in the direction of foundation giving when and if they do occur. Reviewing actual grants is probably a poor way to do this because it is after the fact, and usually several years later. A more appropriate technique might involve interviews with foundation decision-makers designated to elicit shifts in attitudes and policy towards health R & D before and as they occur.

Another important research need is to be able to detect the kinds of research that are being sponsored. The word "kind" here is a "dummy variable" for several as yet unspecified dimensions.

These dimensions might include:

1. Degree of innovation
2. Concentration in "frontier subject areas"
3. Degree of correlation with government funding areas
4. Duration of support for individuals or institutions
5. Likelihood of payoff as a function of time

Finally, in any research assessment activity, there will be, from time to time, the need to respond to specific policy questions. For example:

1. How much of health R & D dollars are being funneled into responses to or defenses for government regulatory requirements?

2. How much of health R & D dollars are being funnelled into the highly publicized and major incidence disease

entities (cancer, heart, and circulatory disease)?

3. How much of health R & D dollars are for complex technological equipment and instruments, how much for research personnel, and how much for overhead?

Obviously other issues of importance related, for example, to Federal tax policy, reporting on foundation activities, Federal funding of health R & D, or other matters which may be of interest are prime candidates for NIH research studies.

APPENDIX A

SOURCES OF INFORMATION AVAILABLE AT THE FOUNDATION CENTER

The Foundation Center, which has the largest collection of public information on foundations, has three primary computer files available for public use:

- Directory Data Bank

This computer file contains basic information concerning the asset size, grant size and fields of interest for approximately 2500 of the largest foundations in the country. In order to be included in the file, a foundation must either have $1 million in total assets, or be making $500,000 in total grants annually. The file contains the address and names of the foundation officers. Each entry corresponds to entries in The Foundation Directory, which is the major publication of the Foundation Center. The computer file is up-dated semi-annually from IRS 990 forms, foundation annual reports and information voluntarily supplied by the foundations. It also contains a very brief description of the overall purpose and activities of each foundation. It contains no information on individual grants made by the foundations.

- Grants Index Data Bank

This file contains brief descriptions of most grants of $5,000 or more made by approximately 420 foundations between 1973 and

the present. It corresponds to the Grants Index published annually by the Foundation Center. Each entry represents one grant and contains the name and address of both the organization making the grant and the recipient of the grant, as well as the date and dollar amount of the grant. A brief description of the purpose of the grant is also included. The information in the file is updated on the basis of information received from participating foundations. In general, the 420 foundations whose grants are included are relatively large foundations in terms of the value of their assets.

- National Data Bank

This data file, which is supplied to the Foundation Center by the IRS each year, contains information abstracted from the 990 forms filed each year by the more than 27,000 foundations. It contains the market value of their assets, the total dollars distributed during the year in satisfaction of the minimum distribution requirements (qualifying distribution) and up to three activity codes. These activity codes are useful in distinguishing among foundations according to the general focus of their grants.

Other Sources

The Foundation Center publishes three major reference works on foundations, The Foundation Directory, the Grants Index, and the Source Book. The Source Book contains detailed descriptions of about 230 foundations with assets of $7 million or more. In addition to the basic data contained in the Directory about each foundation, the

Source Book also includes a full list of grants made during the year.

The other primary source of information available at the Foundation Center is the collection of annual reports (approximately 300 foundations publish annual reports) and microfiche copies of IRS 990 AR and 990 PF forms filed annually by private non-profit foundations. The 990's contain a great deal of fiscal data as required by the tax laws, as well as a complete list of recipients of foundation grants. Each foundation is requested by IRS to list three "activity codes" which describe the foundation's activities, purpose, operations, etc. The activity codes for the 990 form follow.

Activity Code Numbers of Exempt Organizations (select up to three codes which best describe or most accurately identify your purposes, activities, operations or type of organization and enter on page 1 of the return)

Code

Religious Activities

001 Church, synagogue, etc.
002 Association or convention of churches
003 Religious order
004 Church auxiliary
005 Mission
006 Missionary activities
007 Evangelism
008 Religious publishing activities
..... Book store (use 918)
..... Genealogical activities (use 094)
029 Other religious activities

Schools, Colleges and Related Activities

030 School, college, trade school, etc.
031 Special school for the blind, handicapped, etc.
032 Nursery school
..... Day care center (use 574)
033 Faculty group
034 Alumni association or group
035 Parent or parent-teachers association
036 Fraternity or sorority
..... Key club (use 323)
037 Other student society or group
038 School or college athletic association
039 Scholarships for children of employees
040 Scholarships (other)
041 Student loans
042 Student housing activities
043 Other student aid
044 Student exchange with foreign country
045 Student operated business
..... Financial support of schools, colleges, etc. (use 602)
..... Achievement prizes or awards (use 914)
..... Student book store (use 918)
..... Student travel (use 299)
..... Scientific research (see Scientific Research Activities)
046 Private school
059 Other school related activities

Cultural, Historical or Other Educational Activities

060 Museum, zoo, planetarium, etc.
061 Library
062 Historical site, records or reenactment
063 Monument
064 Commemorative event (centennial, festival, pageant, etc.)
065 Fair
088 Community theatrical group
089 Singing society or group
090 Cultural performances
091 Art exhibit
092 Literary activities
093 Cultural exchanges with foreign country
094 Genealogical activities
..... Achievement prizes or awards (use 914)
..... Gifts or grants to individuals (use 561)
..... Financial support of cultural organizations (use 602)
119 Other cultural or historical activities

Other Instruction and Training Activities

120 Publishing activities
121 Radio or television broadcasting
122 Producing films
123 Discussion groups, forums, panels, lectures, etc.
124 Study and research (non-scientific)
125 Giving information or opinion (see also Advocacy)
126 Apprentice training
..... Travel tours (use 299)
149 Other instruction and training

Health Services and Related Activities

150 Hospital
151 Hospital auxiliary
152 Nursing or convalescent home
153 Care and housing for the aged (see also 382)
154 Health clinic
155 Rural medical facility
156 Blood bank
157 Cooperative hospital service organization
158 Rescue and emergency service
159 Nurses' register or bureau
160 Aid to the handicapped (see also 031)
161 Scientific research (diseases)
162 Other medical research
163 Health insurance (medical, dental, optical, etc.)
164 Prepaid group health plan
165 Community health planning
166 Mental health care
167 Group medical practice association
168 In-faculty group practice association
169 Hospital pharmacy, parking facility, food services, etc.

Code

179 Other health services

Scientific Research Activities

180 Contract or sponsored scientific research for industry
181 Scientific research for government
..... Scientific research (diseases) (use 161)
199 Other scientific research activities

Business and Professional Organizations

200 Business promotion (chamber of commerce, business league, etc.)
201 Real-estate association
202 Board of trade
203 Regulating business
204 Better Business Bureau
205 Professional association
206 Professional association auxiliary
207 Industry trade shows
208 Convention displays
..... Testing products for public safety (use 905)
209 Research, development and testing
210 Professional athletic league
..... Attracting new industry (use 403)
..... Publishing activities (use 120)
..... Insurance or other benefits for members (see Employee or Membership Benefit Organizations)
211 Underwriting municipal insurance
212 Assigned risk insurance activities
213 Tourist bureau
229 Other business or professional group

Farming and Related Activities

230 Farming
231 Farm bureau
232 Agricultural group
233 Horticultural group
234 Farmers' cooperative marketing or purchasing
235 Financing crop operations
..... FFA, FHA, 4-H club, etc. (use 322)
..... Fair (use 065)
236 Dairy herd improvement association
237 Breeders association
249 Other farming and related activities

Mutual Organizations

250 Mutual ditch, irrigation, telephone, electric company or like organization
251 Credit Union
252 Reserve funds or insurance for domestic building and loan association, cooperative bank, or mutual savings bank
253 Mutual insurance company
254 Corporation organized under an Act of Congress (see also 904)
..... Farmer's cooperative marketing or purchasing (use 234)
..... Cooperative hospital service organization (use 157)
259 Other mutual organization

Employee or Membership Benefit Organizations

260 Fraternal beneficiary society, order, or association
261 Improvement of conditions of workers
262 Association of municipal employees
263 Association of employees
264 Employee or member welfare association
265 Sick, accident, death, or similar benefits
266 Strike benefits
267 Unemployment benefits
268 Pension or retirement benefits
269 Vacation benefits
279 Other services or benefits to members or employees

Sports, Athletic, Recreational and Social Activities

280 Country club
281 Hobby club
282 Dinner club
283 Variety club
284 Dog club
285 Women's club
Garden club (use 356)
286 Hunting or fishing club
287 Swimming or tennis club
288 Other sports club
Boys Club, Little League, etc. (use 321)
296 Community center
297 Community recreational facilities (park, playground, etc.)
298 Training in sports
299 Travel tours
300 Amateur athletic association
..... School or college athletic association (use 038)
301 Fund raising athletic or sports event

Code

317 Other sports or athletic activities
318 Other recreational activities
319 Other social activities

Youth Activities

320 Boy Scouts, Girl Scouts, etc.
321 Boys Club, Little League, etc.
322 FFA, FHA, 4-H club, etc.
323 Key club
324 YMCA, YWCA, YMHA, etc.
325 Camp
326 Care and housing of children (orphanage, etc.)
327 Prevention of cruelty to children
328 Combat juvenile delinquency
349 Other youth organization or activities

Conservation, Environmental and Beautification Activities

350 Preservation of natural resources (conservation)
351 Combatting or preventing pollution (air, water, etc.)
352 Land acquisition for preservation
353 Soil or water conservation
354 Preservation of scenic beauty
..... Litigation (see Litigation and Legal Aid Activities)
..... Combat community deterioration (use 402)
355 Wildlife sanctuary or refuge
356 Garden club
379 Other conservation, environmental or beautification activities

Housing Activities

380 Low-income housing
381 Low and moderate income housing
382 Housing for the aged (see also 153)
..... Nursing or convalescent home (use 152)
..... Student housing (use 042)
..... Orphanage (use 326)
398 Instruction and guidance on housing
399 Other housing activities

Inner City or Community Activities

400 Area development, re-development or renewal
..... Housing (see Housing Activities)
401 Homeowners association
402 Other activity aimed at combatting community deterioration
403 Attracting new industry or retaining industry in an area
404 Community promotion
..... Community recreational facility (use 297)
..... Community center (use 296)
405 Loans or grants for minority businesses
..... Job training, counseling, or assistance (use 566)
..... Day care center (use 574)
..... Civil rights activity (see Civil Rights Activities)
..... Referral service (social agencies) (use 569)
..... Legal aid to indigents (use 462)
406 Crime prevention
407 Volunteer firemen's organization or auxiliary
..... Rescue squad (use 158)
408 Community service organization
429 Other inner city or community benefit activities

Civil Rights Activities

430 Defense of human and civil rights
431 Elimination of prejudice and discrimination, (race, religion, sex, national origin, etc.)
432 Lessen neighborhood tensions
..... Litigation (see Litigation and Legal Aid Activities)
..... Legislative and political activities (see that caption)
449 Other civil rights activities

Litigation and Legal Aid Activities

460 Public interest litigation activities
461 Other litigation or support of litigation
462 Legal aid to indigents
463 Providing bail

Legislative and Political Activities

480 Propose, support, or oppose legislation
481 Voter information on issues or candidates
482 Voter education (mechanics of registering, voting, etc.)
483 Support, oppose or rate political candidates
484 Provide facilities or services for political campaign activities
509 Other legislative and political activities

Code

Advocacy

Attempt to influence public opinion concerning:
510 Firearms control
511 Selective Service System
512 National defense policy
513 Weapons systems
514 Government spending
515 Taxes or tax exemption
516 Separation of church and state
517 Government aid to parochial schools
518 U.S. foreign policy
519 U.S. military involvement
520 Pacifism and peace
521 Economic-political system of U.S.
522 Anti-communism
523 Right to work
524 Zoning or rezoning
525 Location of highway or transportation system
526 Rights of criminal defendants
527 Capital punishment
528 Stricter law enforcement
529 Ecology or conservation
530 Protection of consumer interests
531 Medical care system
532 Welfare system
533 Urban renewal
534 Busing students to achieve racial balance
535 Racial integration
536 Use of intoxicating beverage
537 Use of drugs or narcotics
538 Use of tobacco
539 Prohibition of erotica
540 Sex education in public schools
541 Population control
542 Birth control methods
543 Legalized abortion
559 Other matters

Other Activities Directed to Individuals

560 Supplying money, goods or services to the poor
561 Gifts or grants to individuals (other than scholarships)
..... Scholarships for children of employees (use 039)
..... Scholarships (other) (use 040)
..... Student loans (use 041)
562 Other loans to individuals
563 Marriage counseling
564 Family planning
565 Credit counseling and assistance
566 Job training, counseling, or assistance
567 Draft counseling
568 Vocational counseling
569 Referral service (social agencies)
572 Rehabilitating convicts or ex-convicts
573 Rehabilitating alcoholics, drug abusers, compulsive gamblers, etc.
574 Day care center
575 Services for the aged (see also 153 and 382)
..... Training of or aid to the handicapped (see 031 and 160)

Activities Directed to Other Organizations

600 Community Chest, United Givers Fund, etc.
601 Booster club
602 Gifts, grants, or loans to other organizations
603 Non-financial services or facilities to other organizations

Other Purposes and Activities

900 Cemetery or burial activities
901 Perpetual care fund (cemetery, columbarium, etc.)
902 Emergency or disaster aid fund
903 Community trust or component
904 Government instrumentality or agency (see also 254)
905 Testing products for public safety
906 Consumer interest group
907 Veterans activities
908 Patriotic activities
909 Non-exempt trust
910 Domestic organization with activities outside U.S.
911 Foreign organization
912 Title holding corporation
913 Prevention of cruelty to animals
914 Achievement prizes or awards
915 Election or maintenance of public building or works
916 Cafeteria, restaurant, snack bar, food services, etc.
917 Thrift shop, retail outlet, etc.
918 Book, gift or supply store
919 Advertising
920 Association of employees
921 Loans or credit reporting
922 Endowment fund or financial services
923 Indians (tribes, cultures, etc.)
924 Traffic or tariff bureau

APPENDIX B

B.1 COMPUTER SEARCHES OF THE FOUNDATION CENTER DATA BANKS

Three distinct searches of the Foundation Center data banks were conducted to identify as many as possible of those foundations which probably support health R & D activities. The purpose of these searches was primarily to subdivide the three lower strata (foundations granting less than $4,000,000) into foundations probably supporting health R & D and those probably not supporting health R & D in order to reduce the variance of the estimates of mean health R & D dollars in each stratum. The searches were also designed to test the feasibility of identifying health supporting foundations through the use of the computer files so that in the future such foundations may be quickly identified.

B.1.1 NATIONAL DATA BANK SEARCH (F.N.I.R.S.)

The first data file searched for possible "health" identifiers was the 1974 IRS National Data File, which contains information on approximately 27,000 foundations. On the IRS 990 forms (which foundations are required to file annually) each foundation is asked to select up to three activity codes which best describe the purposes, activities or operations of the organization. Not all foundations fill in codes. In many other cases, the code 602, for "grants, gifts or loans to other organizations," is used alone.

However, a sufficiently large number of foundations use

codes which identify specific activities so that it is possible to identify for a significant number of foundations medical and health related codes. All foundations which had listed any of the following codes were identified as probably supporting some health R & D:

161 Scientific research (diseases)

162 Other medical research

165 Community health planning

166 Mental health care

Additionally, any foundation in whose name "medic" or "health" appeared was also identified in the search procedure. A total of 1,274 foundations was identified by this procedure as probably supporting health R & D.

TABLE B-1

INCREMENTAL CASES IDENTIFIED BY EACH SEARCH WORD,

STARTING WITH ACTIVITY CODE "161"

Stratum	"161"	"162"	"165"	"166"	"medic", "health" in Foundation name	Total
I	1					1
II	14	6	3	3	4	30
III	47	28	3	4	5	87
IV*	789	236	22	41	77	1,156
Total	842	270	28	48	86	1,274
Percentage	66%	21%	2%	4%	7%	100%

*Estimated based on a sample of 255 out of 1,156 foundations

Of these 1,274 foundations, the 1974 grants list for 121 were examined in detail to determine whether or not the foundation did, in fact, support health R & D in 1974. From Table B-II below it can be seen that this search procedure is relatively effective for foundations in Strata II and III, with 69% and 48%, respectively, of the "identified foundations" actually supporting health R & D. It is important to remember, however, that this search of IRS activity codes is the only computer search possible for most of the Foundations in Stratum IV.

TABLE B-II

STRENGTH OF FNIRS SEARCH BY STRATUM

	Grants list shows:								Total Identified by search as probably supporting health R & D
	Health R&D grants		No health R&D grants		In doubt		Sample Examined		
Stratum	n	%	n	%	4	%	n	%	n
II	16	69%	3	13%	4	17%	23	100%	30
III	12	48%	6	24%	7	28%	25	100%	87
IV	15	21%	24	33%	34	47%	73	100%	1,156
	33	27%	33	27%	45	37%	121	100%	1,274

B.1.2 GRANTS INDEX SEARCH (G.I.S.)

The Grants Index computer file, which contains most grants of over $5,000 for approximately 420 foundations, was searched for health R & D grants using a "key word" approach. Briefly, the procedure con-

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*The list of key words employed in the search was compiled from the index of fields of interest in The Directory as well as review of the grants described in the Grants Index and the descriptions of purpose and activities given in The Directory.

sisted of creating a set of all grant descriptions containing at least one "health" word. Another set of all grants containing at least one "research" word was similarly created. Grants described both in terms of health-related key words and research key words were identified and the foundations which made such grants were singled out. Although the data file contains grants from 1972-1976, just 1975 and 1976 grants were examined, so as to reduce computer costs.

The search identified a total of 128 foundations, most of which were in Strata II and III (61 and 40, respectively).

TABLE B-III

GRANTS INDEX SEARCH

Stratum	Number of foundations identified from search as probably supporting health R & D
I	30
II	64
III	40
IV	7
	128

There are two different ways to assess the relative strength of the Grants Index search procedure. First, it is possible to analyze the grants of the foundations identified by the search as probably supporting health R & D to see how many of these were erroneously identified as probably supporting health R & D by the search process.*

*Analysis of the grants identified by the search reveals that some grants which are not really health R & D are picked up. Therefore, some foundations are identified by the search which have no health R & D grants listed in the index. These foundations may actually have a few health R & D grants because not all foundation grants are listed in the index.

The table below shows for each stratum those foundations which have valid health grants picked up by the search and those whose grants aren't really health R & D (in other words, the extent of search errors).

TABLE B-IV

FOUNDATIONS IDENTIFIED BY GRANTS INDEX SEARCH

AS PROBABLY SUPPORTING HEALTH R & D

Stratum	Foundations that have valid health R & D grants in index	Foundations that have no valid health R & D grants in index	Total
I	26	4	30
II	45	19	64
III	19	21	40
IV	5	2	7
	95	46	141

Of the 46 foundations seemingly erroneously identified, we know from examination of their full grants lists for 1974 that twelve actually did make health R & D grants in 1974 and five did not. The remaining 29 could not be classified or were not examined. The set of key words used in the search could presumably be refined to avoid picking up foundations with no valid health R & D grants in the index. However, this would probably also result in some foundations with valid grants being missed. In other words, the broader the scope of search, the fewer serious omissions there are likely to be, but the more non-health R & D grants that will be included.

A second, more accurate means of assessing the strength of the search is to examine what we actually found when we analyzed the

complete list of grants by these foundations in 1974, for the purpose of estimating total universe health R & D support. Over 100 of the 141 foundations identified by the Grants Index search were examined.

TABLE B-V

STRENGTH OF GRANTS INDEX SEARCH BY STRATA

BASED ON SAMPLE OF 103 FOUNDATIONS

	Grants list shows:						
	Foundation had Health R & D grants		Foundation had no health R & D grants		In doubt		Total identified by the search as probably supporting health R & D
Stratum	n	%	n	%	n	%	n
I	25	83%	5	17%	-	-	30
II	37	63%	17	29%	5	8%	64
III	4	46%	7	46%	1	8%	40
IV	1	50%	1	50%	-	-	7
	67	67%	31	31%	6	6%	141

B.1.3 DIRECTORY SEARCH (DIRS)

The Directory Data Bank, which is updated semi-annually, contains descriptions of more than 2500 foundations and corresponds to the Foundation Directory. This data file was searched using a "key word" approach exactly the same as that used with the Grants Index file. (See below, Section B.2).

A total of 403 foundations were identified by the Directory Data Bank search procedure as probably supporting health R & D: 127

foundations in Stratum II, 205 in Stratum III and 71 in Stratum IV.

Of the three separate searches employed the directory search appears to be the weakest in terms of ability to accurately pick out those foundations with health R & D grants in 1974 based on the analysis of the complete grants list of 198 of these foundations.

TABLE B-VI

STRENGTH OF DIRECTORY SEARCH BY STRATA

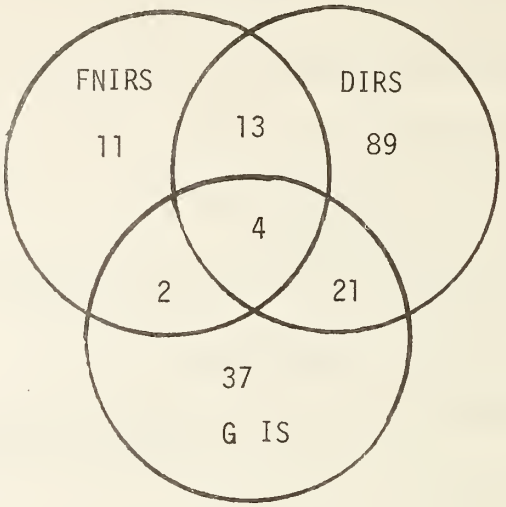
Stratum	Grants list shows: Foundation has health R & D grants		Foundation has no health R & D grants		In doubt		Total identified by the search as probably supporting health R&D
	n	%	n	%	n	%	
II	53	47%	26	23%	33	29%	127
III	15	23%	21	32%	29	45%	205
IV	3	14%	8	38%	10	47%	74
	71	36%	55	28%	72	36%	403

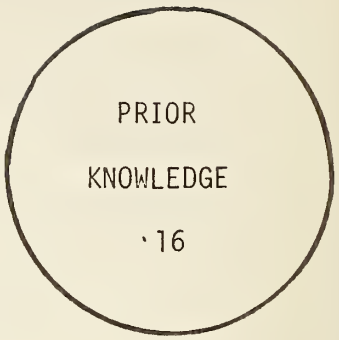
B.1.4 COMPARISON OF THE THREE SEARCHES

As a result of all three searches, in addition to prior knowledge of the grant activities of a few foundations, a total of 1,683 foundations were identified as probably having made health R & D grants in 1974. Diagram B1 reveals the relationship between the three searches and the extent of their overlap. In almost all cases where a foundation was identified by more than one search technique, health R & D grants were found when its complete 1974 grants list was examined.

DIAGRAM B-I: RESULTS OF THE THREE DATA BANK SEARCHES

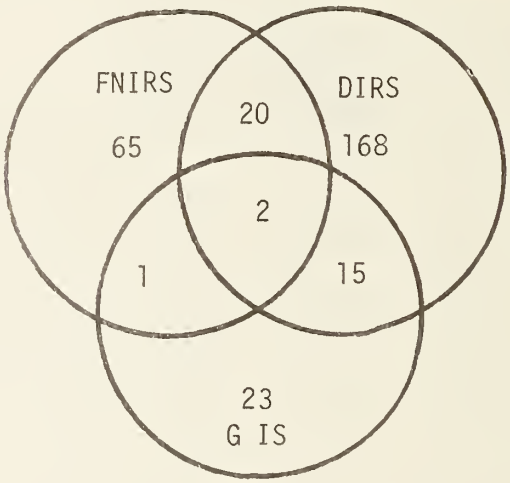
STRATUM II





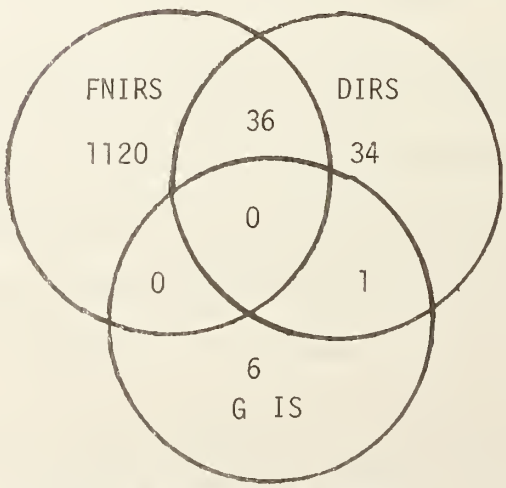
TOTAL = 193

STRATUM III



TOTAL = 293

STRATUM IV*



TOTAL = 1197

*FNIRS numbers are estimated based on a sample of 255 out of 1156 foundations.

Table B-VII summarizes the strength of each search in identifying foundations which support health R & D.

TABLE B-VII

RELATIVE STRENGTH OF EACH SEARCH BY STRATA

Stratum	Search	% of identified foundations with health R & D grants in 1974	% of identified foundations with no health R & D grants in 1974	In doubt	Sample examined	Total identified by the search as probably supporting health R&D*
II	FNIRS	69%	13%	17%	23	30
	DIRS	47%	23%	29%	112	127
	GIS -	63%	29%	8%	59	64
III	FNIRS	48%	24%	28%	25	87
	DIRS	23%	32%	45%	65	205
	GIS	46%	46%	8%	13	40
IV	FNIRS	21%	33%	47%	73	1156
	DIRS	14%	38%	47%	21	71
	GIS	50%	50%	-	2	7

The overall strength of the three search techniques when used in combination can best be evaluated by examining the universe estimate calculations.** For example, in Stratum II, the foundations identified as supporting health R & D account for 89% of the total estimated health

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*These samples and totals are not mutually exclusive because foundations identified by two searches are included in the figures for both searches in the table.

**Ignoring the foundations in doubt for the moment.

R & D grant dollars for the stratum. Half of these foundations had made health R & D grants, while only 12% of the foundations not identified as probably supporting health R & D had made health R & D grants in 1974.

TABLE B-VIII

STRENGTH OF COMBINED SEARCHES BY STRATA

Stratum	% of sampled foundations with health R & D grants		Percent of total estimated health R&D grant $ from foundations identified as probably supporting health R & D
	Identified as probably supporting health R&D	Not identified as probably supporting health R & D	
II	51	12	89
III	25	13	43
IV	19	4	95
Average	34	9	89

The search techniques are effective in identifying Stratum IV foundations supporting health R & D despite the fact that only 5% of the foundations in this stratum are estimated to support health R & D activities. In Stratum III, however, the search techniques appear ineffective with a greater proportion of total estimated health R & D dollars coming from the foundations not identified as supporting health R & D. It should be noted, however, that the proportion of foundations which cannot be classified on the basis of the grants list or the 990 forms is also highest in this stratum.

The search techniques for Stratum III are weak because in

comparison to other strata more foundations are identified as supporting health R & D by the directory search and this search is the least effective.

B.2 DETAILED DESCRIPTION OF THE GRANTS INDEX SEARCH

The Grants Index listing of foundations which probably support health R & D was created with the following set of instructions:

1. Create a set of health related words. Start with "HEALTH" and add the following words one at a time: medic?, hospital?, rehabilitat?, biolog?, psych?, nurs?, population?, drug?, family planning, cancer?, blind?, alcohol?, clinical, nutrit?, disease?, therap?, biochem?, dentist?, reproduction?, and pharmac?.

2. Create a set which is the combination of the following words: demograph?, child abuse, dental, microbiol?, life sciences, malnutrit?, physicolog?, immuno?, endocrin?, contracept?, genetic?, radiolog?, mental retardation, cerebral palsy, dermat?, juvenile delinquency, juvenile delinquents, juvenile delinquent, patholo?, arthrit?, diabet?, sclero?, cardio?, schisto?, metabol?, respirat?, and digest?.

3. Combine the sets created in steps 1 and 2.

4. Create a set of R & D-related words from the following: valuat?, experiment?, examin?, innovat?, investigat?, project?, programs to improve, program to improve, research, study, studies, studying, assess?, and test?.

5. Intersect this set with the health-related set created above.

6. Select 1975 and 1976 grants ONLY.

7. Eliminate the grants from the following 13 foundations:* Ford Foundation, Rockefeller Foundation, Robert Wood Johnson, W. K. Kellogg, Alfred P. Sloan, Rockefeller Bros. Fund, Moody Foundation, Cleveland Foundation, Grant Foundation, Northwest Area Foundation, Research Corp., John A. Hartford Foundation, and China Medical Board.

B.3 DETAILED DESCRIPTION OF THE DIRECTORY SEARCH

The Directory Data Bank listing for foundations which probably support health R & D was created with the following set of instructions:

1. Create a set of health-related words. Start with "health" and add the following words one at a time: medic?, hospital?, population, rehabilitat?, disease?, nurs?, biolog?, cancer, delinqu?, drug?, psych?, and blind?.

2. Create a set which is a combination of the following words: nutrit?, malnutrit?, demograph?, dentis?, therap?, alcohol?, dental?, microbiolog?, biochem?, family planning, reproduct?, psysiolog?, pharmac?, genetic?, life sciences?, radiolog?, mental retardation? cerebral palsy, dermat?, clinical?, diabet?, sclero?, cardio?, and metabol?.

3. Combine the sets created in Steps 1 and 2.

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*Which are already known to support health R & D.

4. Create a set of R & D-related words from the following: evaluat?, examin?, experiment?, innovat?, investigat?, project?, research?, study, studies, test?, problems, and programs to improve.

5. Intersect this set with the health-related set created

6. Divide this resulting set into the four strata based upon the total grant dollars in 1974 of each foundation.

APPENDIX C

ANALYSIS OF FOUNDATION SUPPORT FOR HEALTH R & D

BY GRANT FOCUS AND TYPE OF RECIPIENT

(Based upon Review of Available Grant Data)

TABLE C-I: BREAKDOWN OF HEALTH R & D GRANT DOLLARS IN SAMPLE BY FOCUS AND TYPE OF RECIPIENT (in thousands of dollars)

BIOMEDICAL $

STRATUM		Academic Institutions	Medical Schools	Private Non-Profit organizations	Foreign	Intramural	Other Performers	TOTAL
I		5,328	4,406	6,568	1,818	-	-	18,120
II	Identified by Searches	2,268	1,592	2,016	318	-	15	6,209
II	Not Identified by Searches	93	127	175	-	-	-	396
III	Identified by Searches	444	25	257	-	313	-	1,039
III	Not Identified by Searches	7	-	82	-	-	-	89
IV	Identified by Searches	43	21	74	-	87	-	225
IV	Not Identified by Searches	-	.5	.4	-	-	-	.8

DELIVERY $

I		1,710	662	1,606	337	12	300	4,637
II	Identified by Searches	9	109	961	-	-	20	1,099
II	Not Identified by Searches	-	-	308	-	-	-	308
III	Identified by Searches	-	-	-	-	-	-	-
III	Not Identified by Searches	-	-	2	-	-	-	2
IV	Identified by Searches	-	-	.1	-	-	-	.1
IV	Not Identified by Searches	-	-	-	-	-	-	-

OTHER HEALTH $

I		1,078	12	2,384	1,590	621	40	5,726
II	Identified by Searches	956	329	463	495	-	-	2,242
II	Not Identified by Searches	13	-	.1	-	-	-	14
III	Identified by Searches	19	-	9	-	-	-	28
III	Not Identified by Searches	57	-	67	-	-	-	124
IV	Identified by Searches	45	-	3	-	-	4	52
IV	Not Identified by Searches	-	-	-	-	-	-	-

*Unadjusted for difference in sample years.

TABLE C-II: BREAKDOWN OF ESTIMATED HEALTH R & D GRANT DOLLARS* IN THE UNIVERSE BY FOCUS AND TYPE OF RECIPIENT (in thousands of dollars)

BIOMEDICAL $

STRATUM	Academic Institutions	Medical Schools	Private Non-Profit Organizations	Foreign	Intramural	Other Performers	TOTAL
I	5,328	4,406	6,568	1,818	-	-	18,120
II Identified by Searches	3,039	2,133	2,701	426	-	20	8,320
II Not Identified by Searches	221	302	417	-	-	-	942
III Identified by Searches	1,341	76	776	-	945	-	3,139
III Not Identified by Searches	134	-	1,574	-	-	-	1,708
IV Identified by Searches	525	256	904	-	1,062	-	2,747
IV Not Identified by Searches	-	115	88	-	-	-	203
	10,588	7,288	13,028	2,244	2,007	20	35,179

DELIVERY $

I	1,710	662	1,606	337	12	300	4,637
II Identified by Searches	12	146	1,288	-	-	27	1,473
II Not Identified by Searches	-	-	733	-	-	-	733
III Identified by Searches	-	-	-	-	-	-	-
III Not Identified by Searches	-	-	38	-	-	-	38
IV Identified by Searches	-	-	1	-	-	-	1
IV Not Identified by Searches	-	-	-	-	-	-	-
	1,722	808	3,666	337	12	327	6,882

OTHER HEALTH $

I	1,078	12	2,384	1,590	621	40	5,726
II Identified by Searches	1,281	441	620	663	-	-	3,004
II Not Identified by Searches	31	-	.2	-	-	-	33
III Identified by Searches	57	-	27	-	-	-	85
III Not Identified by Searches	1,094	-	1,286	-	-	-	2,380
IV Identified by Searches	549	-	37	-	-	49	635
IV Not Identified by Searches	-	-	-	-	-	-	-
	4,090	435	4,354	2,253	621	89	11,863
TOTALS	16,400	8,549	21,052	4,834	2,640	436	53,924
	30%	16%	39%	9%	5%	1%	

*Unadjusted for difference in sample years.

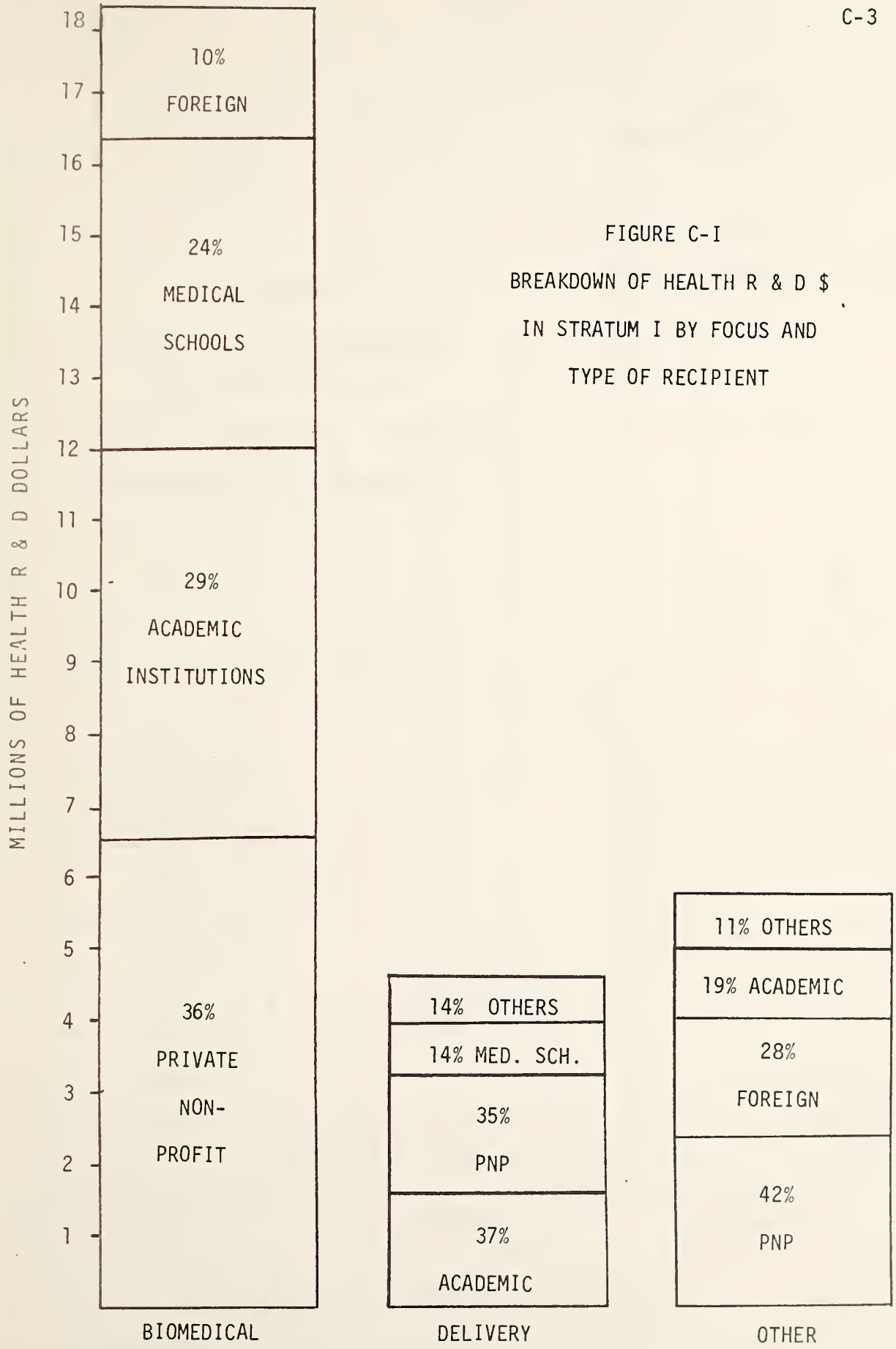


FIGURE C-I

BREAKDOWN OF HEALTH R & D $

IN STRATUM I BY FOCUS AND

TYPE OF RECIPIENT

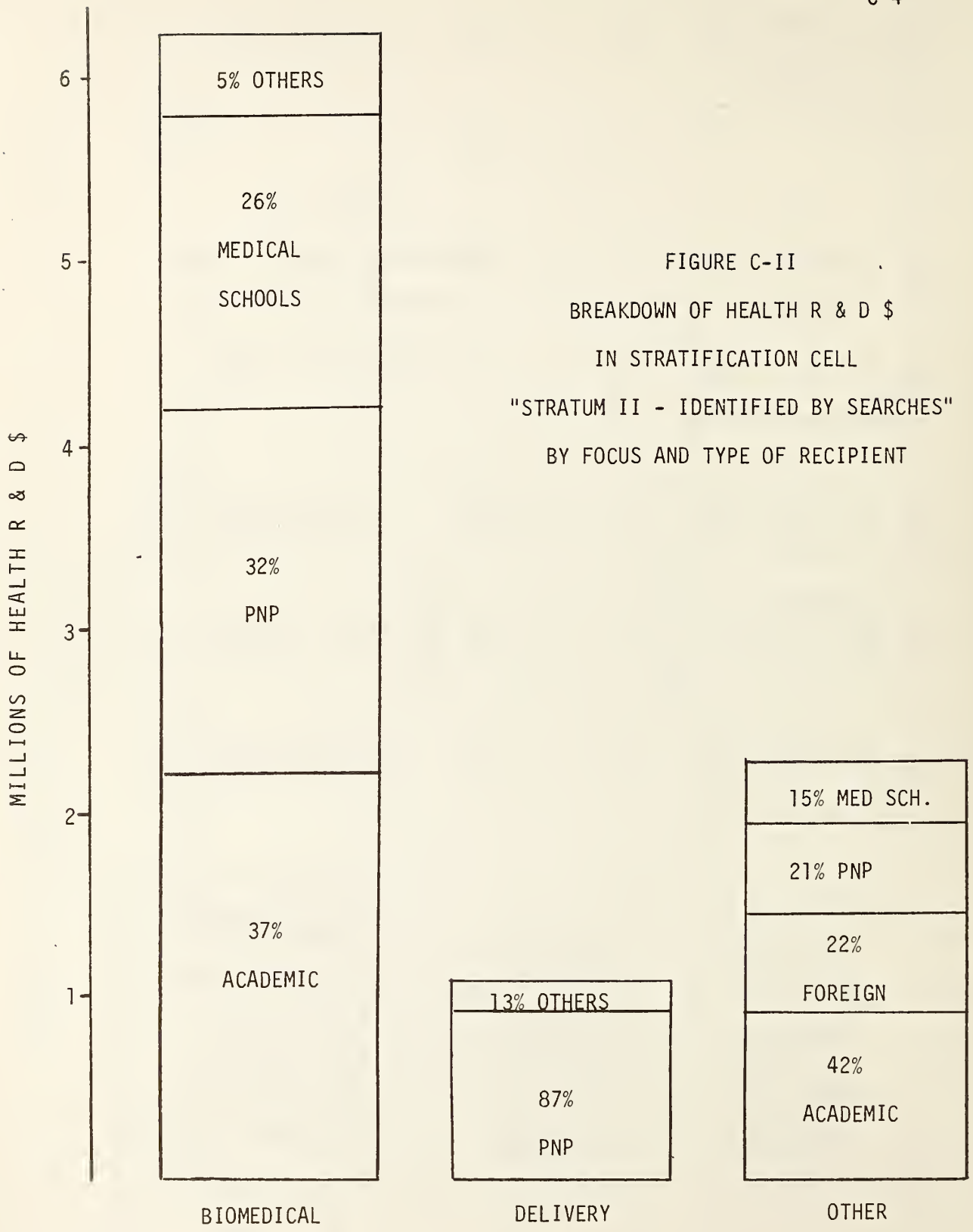


FIGURE C-II

BREAKDOWN OF HEALTH R & D $

IN STRATIFICATION CELL

"STRATUM II - IDENTIFIED BY SEARCHES"

BY FOCUS AND TYPE OF RECIPIENT

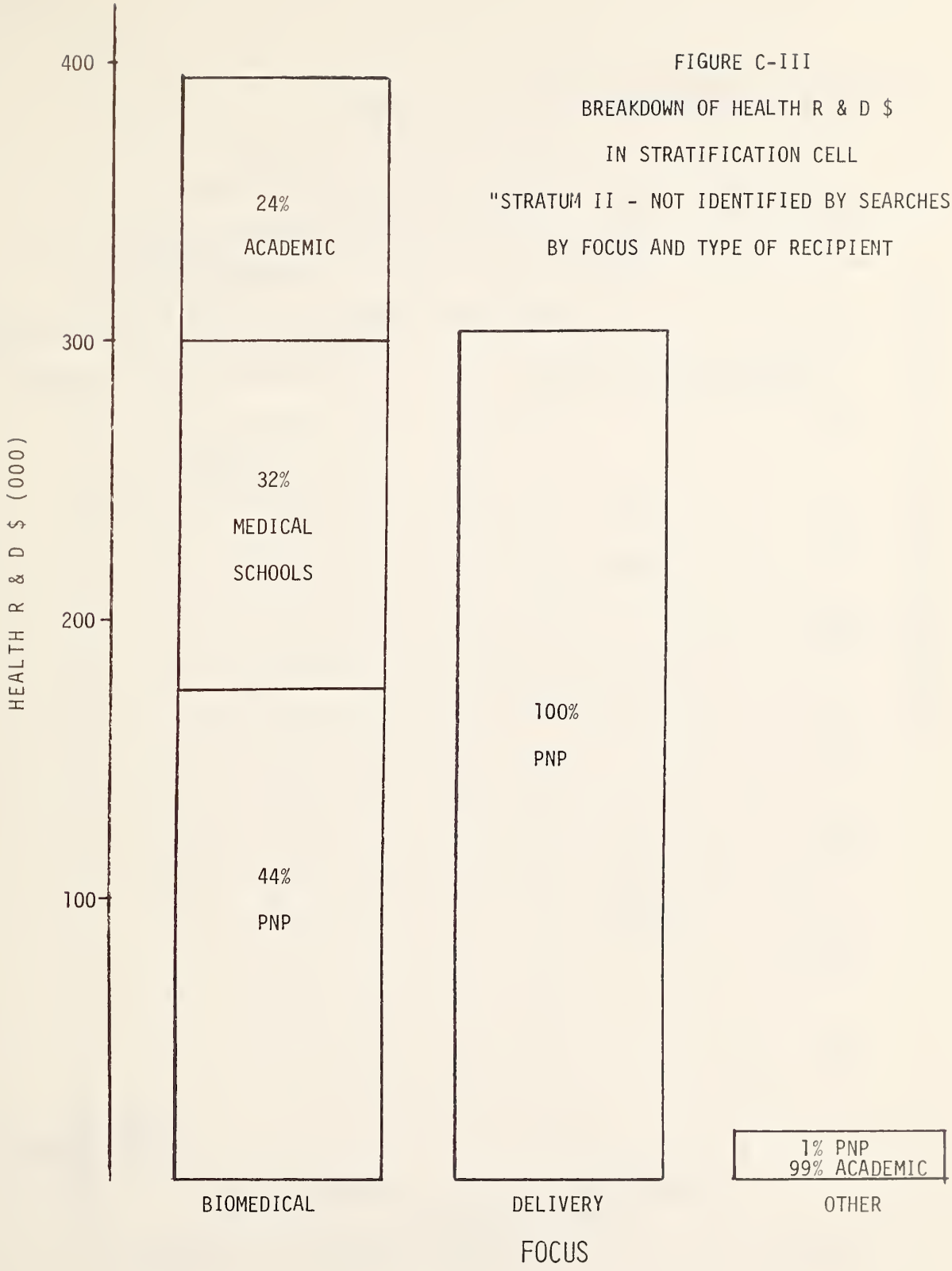
FIGURE C-III

BREAKDOWN OF HEALTH R & D $

IN STRATIFICATION CELL

"STRATUM II - NOT IDENTIFIED BY SEARCHES"

BY FOCUS AND TYPE OF RECIPIENT



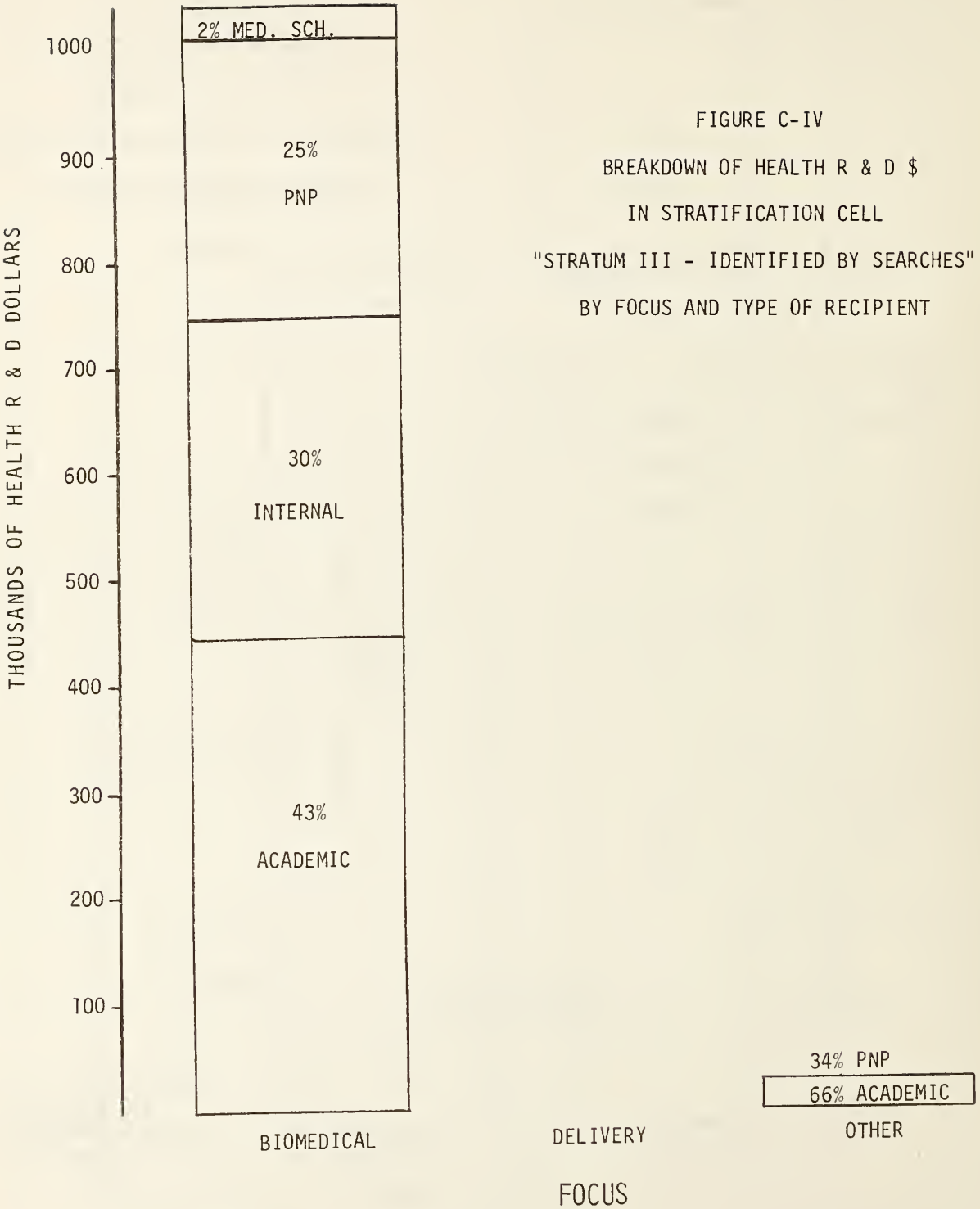


FIGURE C-IV

BREAKDOWN OF HEALTH R & D $

IN STRATIFICATION CELL

"STRATUM III - IDENTIFIED BY SEARCHES"

BY FOCUS AND TYPE OF RECIPIENT

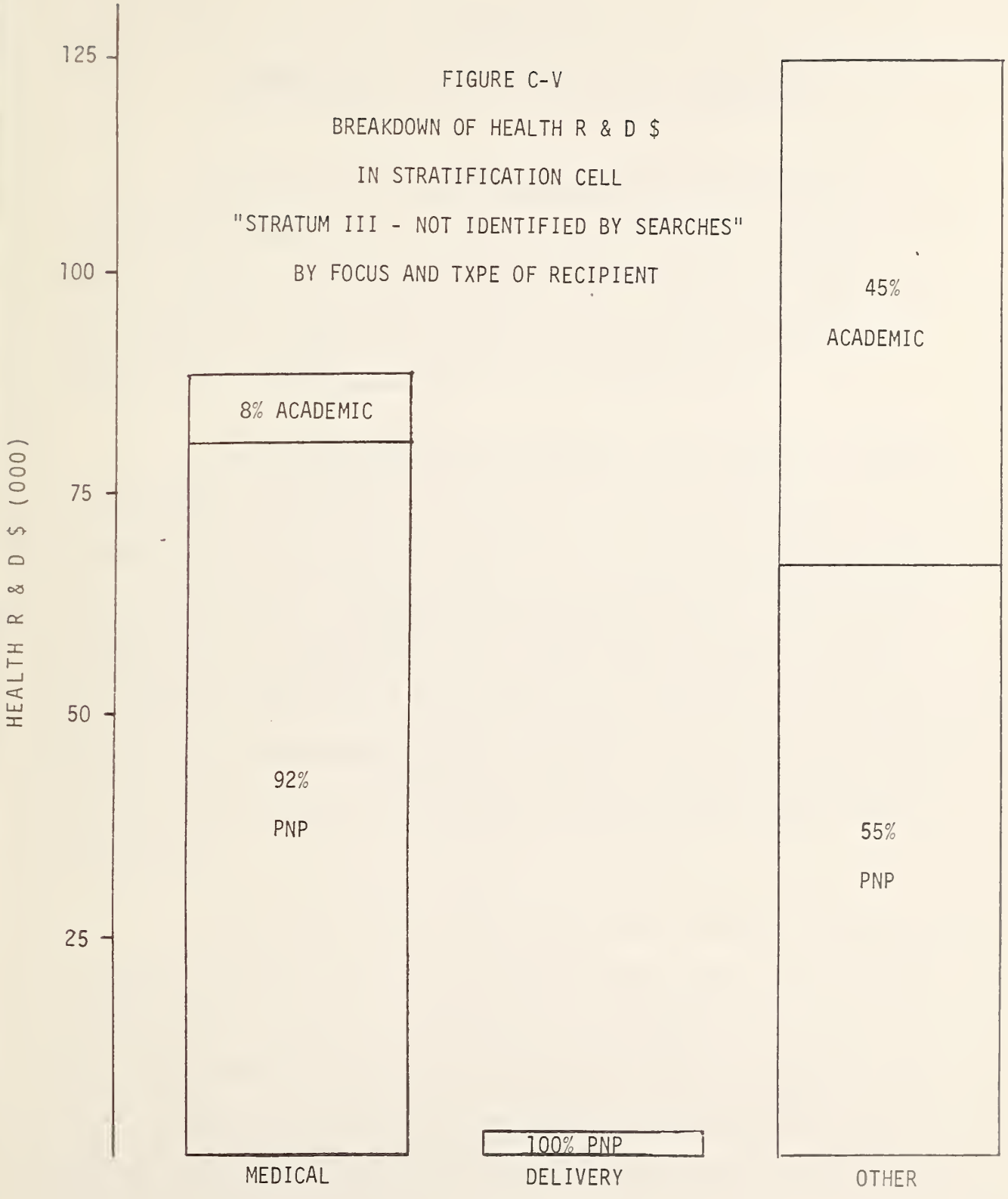
FIGURE C-V

BREAKDOWN OF HEALTH R & D $

IN STRATIFICATION CELL

"STRATUM III - NOT IDENTIFIED BY SEARCHES"

BY FOCUS AND TXPE OF RECIPIENT



APPENDIX D
CONFIDENCE LIMITS FOR DISCRETE VARIABLES

The confidence limits and sample sizes in this research were computed with regard to estimating the dollar amounts of foundation grants to health R & D for the universe; however, there are a great many other questions treated in this report, and many of them have discrete answers of the form a, b, c, yes or no, or true or false.

The distribution of such responses is described by a binomial or multinomial distribution and, since much less informational content is provided in a single yes or no answer than in a continuous variable, much larger sample sizes are required for the same confidence interval or alternatively, at a given sample size, a much larger confidence interval will result. Another way to think about it is if we wish to estimate the percentage of a dichotomous variable, it takes at least 100 responses before we can even estimate to an accuracy of one percent, independent of variability.

In the table below we show the actual confidence intervals as a function of sample size and underlying parameter values (observed percentages) for four levels of confidence. To illustrate the use of the table, if the sample size is 50 and the observed number of "yeses" is 25 or 50%, we can say with 99% confidence that the percentage of "yeses" is between .32 and .68, or with .50 percent confidence that the number of "yeses" is between .45 and .55.

CONFIDENCE INTERVALS FOR A GIVEN SAMPLE SIZE AND OBSERVED VALUE OF A DICHOTOMOUS VARIABLE EXPRESSED AS A PERCENT*

Observed Percent	Sample Sizes 10	25	50	100	150
	99% Confidence Interval				
.10	.00-.55	.01-.42	.03-.26	.04-.20	.05-.17
.25	.02-.70	.10-.53	.12-.43	.15-.37	.17-.35
.50	.12-.88	.24-.76	.32-.68	.37-.63	.39-.61
	95% Confidence Interval				
.10	.00-.46	.02-.30	.03-.23	.05-.18	.06-.16
.25	.04-.62	.10-.47	.13-.40	.17-.35	.18-.33
.50	.18-.82	.29-.71	.35-.65	.40-.60	.42-.58
	90% Confidence Interval				
.10	.00-.24	.03-.28	.03-.17	.06-.14	.07-.13
.25	.05-.44	.09-.40	.15-.35	.20-.30	.21-.29
.50	.19-.71	.32-.67	.28-.62	.44-.56	.44-.55
	50% Confidence Interval				
.10	.0 -.10	.03-.12	.07-.13	.08-.12	.08-.12
.25	.10-.29	.17-.29	.21-.29	.22-.28	.23-.27
.50	.34-.56	.41-.55	.45-.55	.47-.53	.47-.53

*Values for the table are derived from three sources: (1) All 99% and 95% limits come from charts originally attributable to C. J. Clopper and E. S. Pearson, "The Use of Confidence or Fiducial Limits, Biometrica, Vol. XXVI (1934), p. 410. (2) For sample sizes of 50, 100, and 150 in the two remaining confidence intervals, the probabilities were computed using the normal approximation to the bionomial, which gives quite reasonable results with sample sizes of 50 or above, as long as the product of the sample size and the observed percent is in excess of 5. (3) The remaining values (sample sizes of 10 and 25, for confidence intervals of .90 and .50) come from abbreviated tables of the bionomial distribution, the original source for which is Tables of the Binomial Probability Distribution, published by the National Bureau of Standards.

Two comments with respect to use of the table seem appropriate:

First, we are dealing with a stratified sample, so the application of the confidence intervals in the table across the strata is subject to some error, particularly if there has been significantly different weighting of observations in the strata being compared. In any event, the reader should be careful to use the unweighted sample sizes in estimating confidence intervals.

Second, it should be clear that the sample sizes for many of these dichotomous variables are extremely small. Therefore utilizing classical confidence intervals leads to relatively weak statements. We have introduced a 50% confidence interval for the convenience of the reader. We should point out that the use of such a low level of confidence leads to a high Type I error, e.g., "jumping to conclusions" that may not be true. This, however, is usually more of a problem for the researcher than the program manager, since the program manager has to act on the best information he has, and often takes 50-50 chances.